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Do People's World Views Matter?

The Why and How.

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## Abstract

Over the past decades, personality and social psychologists have extensively investigated the role of self-views in individual functioning. Research on world views, however, has been less generative due to overly specific conceptualizations, and little research about how and why they impact life outcomes. To answer the questions of why and how world views matter, we conducted seven studies to examine the functions, antecedents, and consequences of generalized beliefs about the world, operationalized as social axioms (Leung et al., 2002). This research focused on two axiom factors, viz., social cynicism and reward for application. These axioms were found to explain individual differences in self-views over and above personality traits in Hong Kong and US samples (Study 1) and to explain cultural differences in self-views in addition to self-construals among Mainland Chinese, Hong Kong Chinese, East Asian Canadians, and European Canadians (Study 2). Endorsement of social axioms by participants, their parents, and close friends was collected from Mainland China, Hong Kong, and Canada to infer parental and peer influences on world views (Study 3). World views affected psychological well-being through the mediation of positive self-views across three age groups, including children, adolescents, and young adults (Study 4) and over time (Study 5). The mediation of negative self-views was through comparative self-criticism rather than internalized self-criticism (Study 6). Holistic thinking moderated the effect of social cynicism on self-views and psychological well-being (Study 7). These results converge to show that both world views as a distal force and self-views as a proximal force matter in people's subjective evaluation of their lives.

*Keywords:* world views, self-views, social axioms, psychological well-being, holistic thinking

## Do People's World Views Matter?

### The Why and How.

As a cognitive framework that helps people organize information about the self and guide their social behavior, the utility of positive and negative self-views has received growing attention in the past three decades (e.g., Kuiper & Rogers, 1979; Markus, 1977). Theory and research have demonstrated that self-views function like schemas and beliefs to affect psychological outcomes, fueling the popularity of self-help books and programs designed to boost self-esteem (Swann & Seyle, 2005). Recent critiques, however, have challenged the small effect sizes of self-esteem and questioned the heavy emphasis on self-worth, leading to a reversed trend of devaluing self-views (e.g., Baumeister, Campbell, Kneger, & Vohs, 2003, 2005; Crocker & Park, 2004; Marsh & Craven, 2006; Scheff & Fearon, 2004).

In an attempt to reinstate the value of self-views, Swann, Chang-Schneider, and McClarty (2007) argued that the limited predictive validity of self-views stemmed from a mismatch between predictors of global measures (e.g., global self-esteem, general self-efficacy) and specific criteria (e.g., academic performance in a particular subject). They proposed incorporating additional variables in predictive frameworks, matching the specificity of predictors and criteria, and using theory-informed standards for evaluating predictor-criterion relationships. They concluded that people's self-views do matter and that evidence-based, theory-informed programs to improve self-views are still worthwhile.

To further Swann and colleagues' (2007) arguments, we turn to another type of belief, i.e., world views, rather than other types of self-views, as an additional variable to enrich predictive frameworks. The nature and function of world views have long been recognized by anthropologists and used to explain human behavior (W. T. Jones,

1972), while psychologists have placed the utility of world views mainly in cultural contexts (Sue, 1977, 1978a). World views denote people's perceptions of how the world works and reflect their cultural upbringing and life experiences (Ibrahim, 1985; Ivey, & Simek-Downing, 1987; Katz, 1985). Since cultures differ in the mental convictions and beliefs about the world that are socialized in their members, world views are highlighted in multicultural counseling, under the assumption that counselors should understand the world views of their clients from various cultural background in order to implement effective interventions (Sue, 1977). These world views have been mainly discussed in specific domains, such as locus of control (Rotter, 1966) and locus of responsibility (J. M. Jones, 1972), and in different value orientations (Kluckhohn & Strodtbeck, 1961), such as how individuals and cultural groups perceive time focus (past, present, or future), human activity (being, in-becoming, or doing), social relations (lineal, collateral, or individualistic), and people/nature relationships (subjugation, harmony, or mastery).

The specificity of these belief constructs is in sharp contrast to the outburst of enthusiasm for global self-views. Though it is necessary to acknowledge the important role of self-views in the prediction of human behavior and well-being (Swann et al., 2007), social psychologists emphasize the influences of both personality and the situation on social behavior (Lewin, 1936). While personality represents individuals' characteristic attributes, the situation is the social environment in which individuals are embedded (Seeman, 1997). Perceptions of specific situations guide particular behavior, but expectancies of the "general situation" may also shed light on characteristic behavioral patterns and psychological well-being. In this sense, individual differences in expectancies about the world may be conceptualized as a general situation that provides guidance to individual behavior (Bond, 2013).

Hence, the present research attempts to investigate the functions, antecedents, and consequences of general world views. Why and how do world views matter? To answer the *why* question, we suggest that people's world views matter because they can explain individual differences in self-views over and above conventional measures of personality traits, and can explain cultural differences in self-views better than the prevalent measures of self-construals. To answer the *how* question, we examine the sources of influence (parental and peer) on world views across cultures, propose a predictive model in which world views affect psychological well-being through the mediation of self-views, and test the mediation model across age groups and over time. Finally, we further examine a dual-path mediation model to unpack the specific mechanisms accounting for the effects of world views on well-being, and investigate its boundary condition.

### **Conceptualizing and Assessing World Views**

How world views are assessed is contingent on how researchers conceptualize world views. Kluckhohn's (1951, 1956) anthropological framework focuses on value orientations in different cultures, thus incorporating philosophical and psychological dimensions on beliefs, values, assumptions, and behavior. Sue's (1978b, 1981) model is based on two orthogonal dimensions, i.e., locus of control (Rotter, 1966) and locus of responsibility (J. M. Jones, 1972), to categorize individuals into four quadrants: internal locus of control – internal locus of responsibility, external locus of control – internal locus of responsibility, internal locus of control – external locus of responsibility, and external locus of control – external locus of responsibility. The characteristics of each quadrant provide useful implications for counseling and psychotherapy. Ibrahim and Kahn (1987) broadened Kluckhohn's framework to include five variables, viz., views of human nature, interpersonal relationships, nature, time, and activity. Another type of

world view is the belief in a just world that attributes consequences to personal actions or characteristics (e.g., Lerner, 1980). These conceptualizations on world views emphasize individuals' perceptions of their relationship with the world, the person-system relation.

In the present research, we adopt a general framework and regard world views as propositions that people endorse about the world and how it functions (Koltko-Rivera, 2004). Therefore, we use the construct of social beliefs proposed by Leung and colleagues (2002), termed "social axioms" and defined as "generalized beliefs about people, social groups, social institutions, the physical environment, or the spiritual world as well as about categories of events and phenomena in the social world" (Leung & Bond, 2008, p. 198). Social axioms are operationalized as pure belief items that assert the relationship between two external-to-the-self entities or concepts, rather than a constellation of traits, values, or attitudes (Leung et al., 2002). This conceptualization and operationalization emphasize mental representation and cognitive construction of one's physical and social environments exogenous to the self, thereby distinct from self-views.

A five-factor model of social axioms, viz., Social Cynicism, Reward for Application, Social Complexity, Fate Control, and Religiosity (initially named Spirituality), was first identified from Hong Kong and Venezuelan samples, then validated in the US, Japan, and Germany, and subsequently confirmed by multicultural studies in 40 nations (Leung & Bond, 2004). Using multilevel analyses, Cheung, Leung, and Au (2006) tested the factor structure of social axioms using meta-analytic structural equation modeling, and supported the five-factor model at the individual level and adopted a two-factor model at the culture level (labeled Dynamic Externality and Societal Cynicism, see Bond et al., 2004b). This pan-cultural structure provides core

etic dimensions to study the functions, antecedents, and consequences of domain-general, context-independent world views in relation to global self-views.

### **Explaining Individual Differences in Self-Views**

World views represent one's conceptual framework and philosophy of life, reflecting one's experience within social, cultural, environmental, philosophical, and psychological dimensions (Ibrahim, 1985; Ivey et al., 1987). In everyday life, they are not only manifested in assumptions, attitudes, opinions, and conceptions, but also influence perceptions, attributions, decisions, and actions (Sue, 1990). These cognitive processes and behavioral contingencies inevitably ascribe affordances and constraints to the formation and development of self-concept. World views are expectations of the environment, and serve as a guide for an individual when navigating the environment. Thus, world views may account for variation in self-views.

The linkage between world views and self-views can be demonstrated by the four functions of social axioms: instrumental (facilitating goal attainment), ego-defensive (protecting self-worth), value-expressive (reflecting one's values), and knowledge (understanding the world) (Leung et al., 2002). As attainment of goals, protection of self-worth, expression of values, and understanding of the world are all individual endeavours, the functionality of world views is realized through guiding the self to achieve what is important and desirable in life. Kurman (2011) suggested that world views and self-views are mutually dependent, as world views should afford relevant individual traits. For example, a biased view of the world involving mistrust of human nature may make an individual personally cynical; believing that effort leads to desirable outcomes should make an individual hard-working. Though personal attributes are affected by variation in self-views – for example, people with high self-esteem are emotionally stable, extraverted, conscientious, and somewhat agreeable



and open to experience (Robins, Tracy, Trzesniewski, Potter, & Gosling, 2001) – world views contain perceptions that are more than dispositional qualities and can explain individual differences in self-views over and above personality traits.

We propose that two axiom factors should be especially relevant to self-views: social cynicism and reward for application. Social cynicism denotes a negative view of human nature and a biased assessment of life events (Leung et al., 2002). The mistrust of powerful others and social institutions predisposes social cynics to negativity bias, perceiving the dark side of human beings, and orients them to vigilance and skepticism, diminishing the enjoyment of life. As a result, they suffer from low self-esteem (Neto, 2006), low interpersonal trust (Singelis, Hubbard, Her, & An, 2003), and low life satisfaction (Chen, Cheung, Bond, & Leung, 2006). Thus, we hypothesize that social cynicism will be related to negative self-views and poor psychological well-being.

Another factor, reward for application, refers to a belief that efforts invested in human resources will lead to positive outcomes (Leung et al., 2002). It reflects confidence in human agency that is empowered by knowledge, effort, and careful planning. The expectancy of reinforcement motivates individuals to face challenges and overcome difficulties, adopt active coping strategies (Bond, Leung, Au, Tong, & Chemonges-Nielson, 2004a), and adjust better in intercultural contexts (Safdar, Lewis, & Daneshpour, 2006). Thus, we hypothesize that reward for application will be related to positive self-views and better psychological well-being.

### **Explaining Cultural Differences in Self-Views**

Though the basic structure of social axioms has been concluded to be pan-cultural (Leung & Bond, 2004), world views are embedded within cultural contexts, in which the self is prioritized differently. Cultural differences in how people think about themselves in relation to others are predominantly captured by self-construals, with

independent self deriving one's identity from inner attributes (valued more in Western European cultures) and interdependent self connecting one's identity with close relationships (endorsed more in East Asian cultures) (Markus & Kitayama, 1991). Self-construals are often used to account for East-West differences in self-concept, cognition, emotion, and motivation (e.g., Kitayama, Duffy, & Uchida, 2007; Markus & Kitayama, 1991). We suggest that world views can offer additional dimensions to explain cultural differences in self-views over and above self-construals.

In particular, the citizen profiles of social cynicism have been linked with a wide range of socio-economic-political indexes at the country level, such as less frequent church attendance, lower life satisfaction, lower job satisfaction, lower hedonic balance (Leung & Bond, 2004). The negative view of human nature and lack of trust in authority figures and social institutions denoted by social cynicism are not captured by self-construals that focus on personal vs. group orientation. The cynical belief derives from perceiving corruption of power and disregard of ethical means to achieve an end, which varies by culture. Social cynicism is therefore hypothesized to account for cultural differences in self-views beyond self-construals.

### **Antecedents of World Views across Cultures**

In addition to examining the functionality of world views, we attempt to theorize about their sources of influence; i.e., how do people develop their beliefs about the world? Chen and Bond (2010) suggested that world views might derive from two sources: one is personal (e.g., past experiences, life events); the other is social (e.g., family, friends, teachers, significant others). Yet, empirical research on the formation of world views is scarce. Wong, Chen, and Wu (2010) investigated how environmental influences worked through personal and social attributes to shape children's world views. Family dysfunction was found to predict social cynicism positively through the

mediation of low self-esteem and predict reward for application negatively through the mediation of low relationship harmony. Disruptive familial environment and problematic parent-child relationships hamper children's self-worth and relational competence. Accordingly, children are more likely to develop a cynical belief and less likely to perceive an effort-reward link. These personal and social pathways reveal the importance of one's proximal environment and close others in the development of world views.

Using a different approach, Boehnke (2009) administered the Social Axioms Survey (Leung et al., 2002) among East German university students and their parents. He compared parent-child correlations of social axioms to shed light on intergenerational transmission of world views. Perhaps due to rapid political and social change in East Germany, the transmission effects vary greatly from weak agreement on social complexity to strong agreement on religiosity (and "areligiousness"). The parent-child similarities on social cynicism and reward for application are small to medium. The present study extends this line of research to include both parent and peer ratings of social cynicism and reward for application, which are most relevant to self-views, and compares the familial and peer influences on world views in both Eastern and Western cultures (Mainland China, Hong Kong, and Canada). As people tend to choose friends who are similar to them in attitudes, values, and beliefs, we predict that both parents' and close friends' world views are significantly related to those of participants from Eastern and Western cultures without significant differences between them.

### **Predicting Well-Being through Positive Self-Views**

How do world views matter? We propose a mediation model in which world views affect psychological well-being through the mediation of self-views. Prior studies have

documented that social cynicism and reward for application are especially related to well-being indicators and mental health outcomes (e.g., Chen, Wu, & Bond, 2009; Hui & Hui, 2009; Lam, Bond, Chen, & Wu, 2010). For instance, social cynicism was found to predict life satisfaction concurrently (Chen et al., 2006) and prospectively (Lai, Bond, & Hui, 2007); reward for application was positively related to life satisfaction (Chen et al., 2006) and coping (Safdar et al., 2006). To unpack the mechanisms underlying the relations between social axioms and well-being, we test the mediation effects of self-views across different age groups and over time.

Self-views are an individual's perceptions and evaluations of the self. Positive self-image buffers stressors in the social world and is beneficial to survival and adaptation. Self-views, such as self-esteem, have been associated with psychological health in empirical studies (e.g., Civitci & Civitci, 2009; Dahlbeck & Lightsey, 2008; Mullis & Chapman, 2000). Mullis and Chapman (2000) found that adolescents with higher levels of self-esteem utilized less emotion-focused coping and experienced better psychological adjustment. Civitci and Civitci (2009) tested both the mediating and moderating role of self-esteem in the relation between loneliness and life satisfaction among adolescents. Their results failed to support the moderating effect of self-esteem, but indicated that when loneliness decreased, life satisfaction increased and this effect was mediated by self-esteem. Positive judgments and evaluations that adolescents make about themselves facilitate the development of more effective and satisfying relationships, and thus they feel less lonely and more satisfied with their lives.

In addition, Lai and colleagues (2007) revealed how self-views mediated the linkage between world-views and life satisfaction. They conducted a one-year longitudinal study among university students, and suggested that social cynicism brought less social engagement and less positive social feedback. Such negative social

feedback would be reflected in lower self-esteem, which in turn would result in lower satisfaction with one's life. Therefore, we hypothesize that individuals who have more interpersonal resources (low in social cynicism) will develop better relationships with others, resulting in higher evaluation of themselves and their lives. On the other hand, those who believe effort leads to success (high in reward for application) make more endeavors and perform better when facing difficulties and challenges, leading to positive self-views and better psychological well-being.

### **Predicting Well-Being through Negative Self-Views**

Drawing on research linking self-esteem and life satisfaction, the relations between positive self-views and psychological well-being have been well established in the literature (e.g., Diener, 1984; Diener & Diener, 1995; Diener, Oishi, & Lucas, 2003; Kwan, Bond, & Singelis, 1997). The pathways from world views to well-being through the mediation of positive self-views have also received initial support (Lai et al., 2007). Indeed, the role of positive self-views, such as self-esteem and self-efficacy, in psychological functioning has received more attention than negative self-views, evident from burgeoning self-help books and programs to boost self-confidence. How world views work through negative self-evaluation processes to affect well-being is yet to be identified.

Research indicates that negative self-evaluation can take two forms, namely comparative self-criticism and internalized self-criticism (Thompson & Zuroff, 2004). People high in comparative self-criticism tend to think that others make unreasonable demands on themselves, and hence they are likely to be unsatisfied with the self because of their perceived high externalized standards of others. In contrast, some individuals view themselves in a negative light because they hold highly unrealistic internalized standards on themselves, and they blame themselves for failing to meet

these ideals. While the two forms of self-criticism are associated with low self-esteem and high levels of depression, they show different correlates with other constructs (Thompson & Zuroff, 2004). For instance, people high in comparative self-criticism are high in socially-prescribed perfectionism such that they feel other people are too demanding, thereby exhibiting a less compromising and collaborative interpersonal style. On the other hand, people high in internalized self-criticism are high in self-oriented perfectionism such that they set high standards for themselves.

We hypothesize that social cynicism will be positively related to comparative self-criticism because people high in cynicism tend to believe that other people are hostile and demanding. On the other hand, people high in reward for application will be less likely to base their self-evaluation on external standards because they strongly believe that efforts and hard work should help them obtain their goals. Comparative self-criticism has been found to make people vulnerable to interpersonal hostility and distrust and prone to submissive behavior and depression (Öngen, 2006), as unreasonable external standards are beyond one's control. Internalized self-criticism, however, is more similar to self-oriented perfectionism, i.e. holding high standards and expectations of the self (Hewitt & Flett, 1991), which may be more under personal control. We thus predict that comparative self-criticism will be more strongly related to psychological well-being than will be internalized self-criticism, and hence comparative self-criticism (but not internalized self-criticism) will mediate the effects of the two axioms on psychological well-being. Since world views reflect one's perception of the world, when extended to the self they may be manifested in one's perception of others' expectations of the self, as captured by comparative self-criticism. World views are thus channeled through comparative self-criticism – rather than internalized self-criticism, which arises from internal standards – to affect one's

assessment of life.

### **Boundary Conditions of the Mediation Model**

The mediation model that we propose hypothesizes that how people see the world affects how they see themselves, which is closely related to how they evaluate their own lives. The influence of world views on self-views is a cognitive association process, in which individuals connect what they perceive in the world – people, their interactions, social institutions, and non-material forces (Leung & Bond, 2004) – with judgment about themselves, and extend generalized expectancies to self-evaluations. We further suggest that the degree to which world views affect self-views is a function of individual differences, especially varied by the cognitive style of holistic vs. analytic thinking.

Holistic thinking is characterized by attending to the context as a whole and the relations among objects, whereas analytic thinking is characterized by focusing on objects and attributes independent from their contexts (Nisbett, 2003; Nisbett, Peng, Choi, & Norenzayan, 2001). People with a more holistic thinking style are more likely to perceive elements in the world as interrelated, and especially to cognitively link the field in which the elements are embedded to the elements themselves, such as in memory tasks for focal objects in different contexts (Nisbett et al., 2001). This associative way of thinking about objects and their context should make it more likely that holistic thinkers' world views will leak into self-views, as the self and its situation are perceived as connected. For example, when explaining the causes of social behavior, while analytic thinkers tend to solely use internal object-based explanations (e.g. personality traits), holistic thinkers are more likely to use both internal object-based and external context-based explanations (e.g. both traits and situation; Norenzayan, Choi, & Nisbett, 2002). Hence, holistic thinkers may form their self-views by taking into

account their knowledge about how the social world operates. In contrast, people with an analytic thinking style perceive entities in the universe as independent, and are more likely to ignore situational information when making attributions of social behavior (Norenzayan et al., 2002). Such a cognitive style makes it less likely that world views will be associated with self-views, as the self is evaluated as an autonomous entity.

In particular, holistic thinkers with cynical beliefs about the world should be more likely to view themselves negatively than analytic thinkers with cynical beliefs, forming a negative self-image with lower levels of self-esteem and psychological well-being. Thus, we hypothesize that while self-esteem should mediate the relation between social cynicism and psychological well-being, holistic thinking will moderate the effect of social cynicism on self-esteem, with the effect being stronger among people with high rather than low holistic thinking. Likewise, holistic thinkers pay more attention to the context, and the effect of reward for application on self-views is hypothesized to be stronger for this group of individuals.

### **The Present Research**

The present research investigated the functions, antecedents, and consequences of world views in seven studies. The first two studies examined the functions of world views in relation to self-views. Study 1 included two types of self-views: personal self-esteem, which refers to an overall sense of self-worth obtained from individual characteristics (Rosenberg, 1965), and collective self-esteem, which refers to an overall sense of self-worth derived from one's group memberships (Luhtanen & Crocker, 1992). We intended to show that social cynicism and reward for application explained variance in both personal and collective self-esteem over and above personality traits among Hong Kong Chinese ( $n = 155$ ) and Americans ( $n = 216$ ). Study 2 was conducted in four cultural groups, viz., Mainland Chinese ( $n = 199$ ), Hong Kong Chinese ( $n =$



206), East Asian Canadians ( $n = 78$ ), and European Canadians ( $n = 83$ ). We attempted to demonstrate that social cynicism further explained cultural differences in another type of self-view, i.e., self-efficacy, in addition to independent self-construal.

In Study 3, we recruited Mainland Chinese ( $n = 107$ ), Hong Kong Chinese ( $n = 110$ ), and Canadians ( $n = 40$ ), and invited a parent and close friend of each of the participants to complete the measures on social cynicism and reward for application. Self-parent and self-friend correlations were compared across cultures to infer parental and peer influences as antecedents of world views.

Studies 4-6 investigated the consequences of world views and tested the mediation effects of self-views on the relations between world views and psychological well-being. In Study 4, we tested the mediation model among three age groups: children ( $n = 119$ ), adolescents ( $n = 203$ ), and young adults ( $n = 220$ ) in Hong Kong, and examined whether the cognitive process of how world-views affect well-being through self-views was constant across different developmental stages. Study 5 adopted a prospective design to evaluate the mediation model using weekly measures over four consecutive weeks among Hong Kong Chinese ( $n = 173$ ). This study tested both a domain-general model, i.e., social cynicism predicted well-being indicators (life satisfaction and perceived stress) through the mediation of self-esteem, and a domain-specific model, i.e., reward for application predicted academic satisfaction through the mediation of self-perception of academic ability.

Study 6 differentiated two types of negative self-evaluation processes, and showed that the effects of social cynicism and reward for application were mediated through comparative self-criticism rather than internalized self-criticism ( $n = 124$ ). Finally, Study 7 examined the boundary condition of the mediation model by testing the moderating role of holistic thinking in the mediation model ( $n = 109$ ). Taken together,

the seven studies aimed at answering the questions of why world views, like self-views, matter, and how they matter.

### Study 1

Studies 1-2 aim to demonstrate the predictive validity of world views on self-views, answering the question of *why world views matter*. Previous studies have established that social axioms as a cognitive construct are distinct from values as a motivational construct, because values focus on “what”, that is, important goals in one’s life, whereas social axioms focus on “how”, that is, the ways to achieve these goals (Leung, Au, Huang, Kurman, Niit, & Niit, 2007). Social axioms have also been shown to predict individual difference variables, such as vocational interests, ways of coping, and styles of conflict resolution, over and above values (Bond et al., 2004a). Although social axioms tap one’s belief system, which is often conceptualized by psychologists in personality terms, when social axioms have been assessed along with personality traits only modest overlap has been found (Chen, Bond, & Cheung, 2006; Chen, Fok, Bond, & Matsumoto, 2006). Personality traits are characteristics of individuals themselves, whereas social axioms are perceptions of the world “out there.”

To demonstrate that world views can explain individual differences in self-views over and above personality traits, in Study 1 we tested the predictive power of social cynicism and reward for application on two self-view measures, namely self-esteem (Rosenberg, 1965) and collective self-esteem (Luhtanen & Crocker, 1992), while controlling for the Big Five personality factors. Moreover, we drew samples from an East Asian culture (Hong Kong) and a Western culture (the United States) to examine the generalizability of the effects of social axioms on self-views. Since the objective of this study is to test the incremental predictive validity of social axioms across cultural groups, we do not hypothesize cultural differences in the variables under study.

## Method

### Participants and Procedure

One hundred and fifty-five participants (81 females;  $M_{age} = 20.55$ ,  $SD = 1.59$ ) from a university in Hong Kong responded to a recruitment email and took part in the study. All of them were of Chinese descent. For the US sample, 216 participants (147 females;  $M_{age} = 19.65$ ,  $SD = 2.70$ ) were recruited from a large Midwestern university. Most of them identified themselves as Caucasians (85.65%), with 3.70% African Americans, 3.70% Asian Americans, 3.70% Hispanic Americans, and 3.24% Multi-racial Americans. The questionnaire was administered online to both groups, using Chinese and English versions, respectively. Participants were asked to report demographic information at the end of the questionnaire. In all studies reported in this paper, informed consent was obtained, and confidentiality was ensured.

### Measures

For all the scales reported in this paper, standard translation and back-translation (Brislin, 1986) were conducted if an extant Chinese version was not available.

**Social cynicism and reward for application.** The 18-item subscale of social cynicism and the 14-item subscale of reward for application were extracted from the Social Axioms Survey (SAS; Leung et al., 2002). The SAS is a pan-cultural version that has been well validated in a large-scale study across 40 cultural groups (Leung & Bond, 2004). Respondents rated each belief statement on a 5-point Likert scale ranging from 1 (*strongly disbelieve*) to 5 (*strongly believe*). A sample item for social cynicism is “Powerful people tend to exploit others” ( $\alpha = .81$  for HK and  $.78$  for US); a sample item for reward for application is “One will succeed if he/she really tries” ( $\alpha = .76$  for HK and  $.67$  for US).

**Self-esteem.** The Rosenberg Self-Esteem Scale (Rosenberg, 1965) measured how

participants viewed themselves (e.g., “I feel that I have a number of good qualities”). Respondents rated each item on a 4-point scale ranging from 1 (*strongly disagree*) to 4 (*strongly agree*) ( $\alpha = .85$  for HK and  $.91$  for US).

**Collective self-esteem.** The 20-item Collective Self-Esteem Scale (Luhtanen & Crocker, 1992) measured how participants viewed themselves as a member of social groups (e.g., “In general, I’m glad to be a member of the social groups I belong to”). The measure consists of four components, namely membership, private, public, and importance to identity, which points to a single factor ( $\alpha = .85$  for HK and  $.91$  for US). Respondents rated each item on a 7-point scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*).

**Big Five personality.** We assessed personality traits using the 20-item International Personality Item Pool measure (Donnellan, Oswald, Baird, & Lucas, 2006). Each personality factor was measured by asking participants to rate how accurately each of the four statements described them, using a 5-point scale ranging from 1 (*very inaccurate*) to 5 (*very accurate*). Acceptable reliabilities were obtained for this relatively short measure (neuroticism:  $\alpha = .79$  for HK and  $.65$  for US; extraversion:  $\alpha = .76$  for HK and  $.81$  for US; intellect:  $\alpha = .67$  for HK and  $.65$  for US; agreeableness:  $\alpha = .59$  for HK and  $.62$  for US; conscientiousness:  $\alpha = .60$  for HK and  $.68$  for US).

## Results

Descriptive statistics and bivariate correlations of the measures are summarized in Table 1. First, we examined the measurement equivalence of social cynicism and reward for application in the Hong Kong and US samples; that is, whether the scales assessed the constructs similarly across cultures. We tested a configural model with the two social axioms as two correlated latent factors formed by three parcels each (averaging four to six items for each parcel), since the sample sizes were relatively

small to examine a more complex model based on items (see Little, Cunningham, Shahar, & Widaman, 2002 on using item parceling in structural equation modeling). Model fit was indicated by the comparative fit index (CFI), non-normed fit index (NNFI) and root-mean-square error of approximation (RMSEA). Usually, CFI and NNFI higher than .90 and an RMSEA lower than .08 are indicators of adequate fit of the model (Byrne, 1994). To examine metric equivalence, factor loadings were then constrained to be equal. Chi-square difference tests were computed to compare the constrained and unconstrained, baseline models, with non-significant results indicating no significant change of model fit. In other words, a non-significant chi-square difference test indicates that the two groups are equivalent in terms of factor loadings after adding the equality constraints, whereas a significant chi-square difference test suggests that the two groups are not equivalent.

The two-factor model tested across the two cultural groups fit the data well:  $\chi^2(16, N = 371) = 22.46, p > .05$ , CFI = .99, NNFI = .98, and RMSEA = .05, indicating equivalence of the configural model. After we constrained the factor loadings of the parcels to be equal across groups, model fit did not change significantly as indicated by the non-significant chi-square difference test:  $\Delta\chi^2(4, N = 371) = 5.36, p > .05$ . This revealed metric equivalence across the two groups. Moreover, the model showed acceptable fit to the data:  $\chi^2(20, N = 371) = 27.82, p > .05$ , CFI = .99, NNFI = .98, and RMSEA = .05. These results suggested that the two social axioms were equivalent in their factor structure and metric between the Hong Kong Chinese and American samples, and hence associations involving the two social axioms could be meaningfully compared across cultures.

Second, we examined the zero-order correlations between the two social axioms and the two self-view measures. In both the Hong Kong and US samples, social

cynicism was negatively related to self-esteem and collective self-esteem, while reward for application was positively associated with self-esteem and collective self-esteem,  $ps < .05$ .

Hierarchical regression analysis was conducted to test the predictive power of social cynicism and reward for application on self-esteem and collective self-esteem over and above personality traits. We first entered age and gender in block 1 to control for the effects of demographic variables, and the Big Five personality factors were entered in block 2. Then, social cynicism and reward for application were added in the last block.

The regression results for self-esteem are summarized in Table 2. Personality factors as a whole significantly predicted self-esteem in both the Hong Kong and US samples (HK:  $R^2$  change = .41,  $F(5, 145) = 20.87$ ,  $p < .001$ ; US:  $R^2$  change = .32,  $F(5, 207) = 19.57$ ,  $p < .001$ ). In both cultural groups, the effects of neuroticism (HK:  $\beta = -.27$ ,  $t(145) = -3.98$ ,  $p < .001$ ; US:  $\beta = -.38$ ,  $t(207) = -5.98$ ,  $p < .001$ ) and extraversion (HK:  $\beta = .29$ ,  $t(145) = 4.05$ ,  $p < .001$ ; US:  $\beta = .28$ ,  $t(207) = 4.60$ ,  $p < .001$ ) were significant. Intellect ( $\beta = .18$ ,  $t(145) = 2.81$ ,  $p < .01$ ) and conscientiousness ( $\beta = .34$ ,  $t(145) = 5.03$ ,  $p < .001$ ) predicted self-esteem significantly only among Hong Kong participants. The two social axioms explained additional variance of self-esteem over and above personality factors significantly in both cultural groups (HK:  $R^2$  change = .04,  $F(2, 143) = 5.61$ ,  $p < .01$ ; US:  $R^2$  change = .07,  $F(2, 205) = 11.69$ ,  $p < .001$ ). Specifically, social cynicism predicted self-esteem negatively (HK:  $\beta = -.16$ ,  $t(143) = -2.39$ ,  $p = .05$ ; US:  $\beta = -.27$ ,  $t(205) = -4.59$ ,  $p < .001$ ), and reward for application predicted self-esteem positively (HK:  $\beta = .16$ ,  $t(143) = 2.47$ ,  $p < .05$ ; US:  $\beta = .14$ ,  $t(205) = 2.40$ ,  $p < .05$ ).

Regression results for collective self-esteem are summarized in Table 3. In a

similar vein, personality factors as a whole significantly predicted collective self-esteem in the two cultural groups (HK:  $R^2$  change = .19,  $F(5, 146) = 7.56$ ,  $p < .001$ ; US:  $R^2$  change = .22,  $F(5, 207) = 12.31$ ,  $p < .001$ ). The effect of agreeableness was significant (HK:  $\beta = .24$ ,  $t(146) = 2.92$ ,  $p < .01$ ; US:  $\beta = .33$ ,  $t(207) = 4.97$ ,  $p < .001$ ). Furthermore, conscientiousness positively predicted collective self-esteem in the Hong Kong sample,  $\beta = .19$ ,  $t(146) = 2.47$ ,  $p < .05$ , while extraversion positively predicted collective self-esteem in the US sample,  $\beta = .21$ ,  $t(207) = 3.15$ ,  $p < .01$ . The two social axioms explained additional variance of collective self-esteem over and above personality factors significantly in both groups (HK:  $R^2$  change = .05,  $F(2, 144) = 5.21$ ,  $p < .01$ ; US:  $R^2$  change = .16,  $F(2, 205) = 27.98$ ,  $p < .001$ ). Specifically, social cynicism negatively predicted collective self-esteem in both groups (HK:  $\beta = -.20$ ,  $t(144) = -2.70$ ,  $p < .01$ ; US:  $\beta = -.38$ ,  $t(205) = -6.35$ ,  $p < .001$ ). The positive effect of reward for application was significant in the US sample,  $\beta = .30$ ,  $t(205) = 5.14$ ,  $p < .001$ , but marginal in the Hong Kong sample,  $\beta = .14$ ,  $t(144) = 1.94$ ,  $p = .06$ .

In general, world views are significantly related to self-views in Chinese and American cultures. People high in social cynicism have a negative view of themselves and the social groups they belong to, whereas people who strongly believe in reward for application hold a positive view of themselves and their identified social groups. Moreover, while personality factors are significantly associated with self-esteem and collective self-esteem, the two social axioms demonstrate additional predictive power over and above traits to explain individual differences in self-views (explaining 4% to 16% additional variance over personality traits).

## Study 2

In this study, we examined how world views could explain cross-cultural differences in another type of self-view, self-efficacy, which denotes perceived

capabilities to complete a task or obtain a goal (Bandura, 1997). Studies have shown that Chinese generally reported lower levels of self-efficacy than did Westerners (e.g., Chen, Chan, Bond, & Stewart, 2006), and independent self-construal has been proposed to explain the importance of self-attributes in Western contexts (Markus & Kitayama, 1991). We hypothesized that social cynicism could further explain cultural differences in self-efficacy in addition to independent self-construal, and sampled four groups from Eastern and Western cultures in the current study: Mainland Chinese, Hong Kong Chinese, East Asian Canadians, and European Canadians. Hong Kong is exposed to influences of both traditional Chinese culture and Western culture, and is thus more Westernized than Mainland China, but less Westernized than Canada. Among Canadians, East Asian Canadians should be more acculturated to individualistic values than Hong Kong Chinese but less than European Canadians. Therefore, these four groups form a gradation of endorsement of Western, individualistic cultural characteristics.

## Method

### Participants and Procedure

A total of 567 university students participated in the current study. Four groups of participants were sampled from three locations. We recruited 199 Mainland Chinese (93 females;  $M_{age} = 20.52$ ,  $SD = 2.16$ ) from a university in Beijing, China and 206 Hong Kong Chinese (93 females;  $M_{age} = 20.68$ ,  $SD = 1.39$ ) from a university in Hong Kong. In addition, 161 Canadian born students (119 females;  $M_{age} = 20.55$ ,  $SD = 3.78$ ) were recruited from a university in Vancouver, Canada, with 83 of them being European Canadians and 78 East Asian Canadians. Participants in Mainland China and Hong Kong completed a questionnaire with the following scales in Chinese, while East Asian and European Canadians completed the English version.



## Measures

**Social cynicism and reward for application.** A shortened version of the SAS was used in the current study (Leung & Bond, 2004;  $\alpha$ 's ranging from .66 to .74 for social cynicism;  $\alpha$ 's ranging from .53 to .71 for reward for application).

**Self-efficacy.** The Generalized Self-Efficacy Scale (Schwarzer & Jerusalem, 1995) was used to measure one's self-perceived competence (e.g., "I can always manage to solve difficult problems if I try hard enough"). Responses were anchored on a 4-point Likert scale ranging from 1 (*strongly disagree*) to 4 (*strongly agree*). Acceptable reliabilities were observed across cultural groups ( $\alpha$ 's ranging from .81 to .88).

**Independent self-construal.** We used the Self-Construal Scale developed by Gudykunst and colleagues (1996) to measure the independent view of the self (e.g., "I try not to depend on others"). Responses were anchored on a 7-point scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*) ( $\alpha$ 's ranging from .76 to .79).

## Results

As in Study 1, we examined the measurement equivalence of social cynicism and reward for application using multiple-group analysis among the four cultural groups, namely Mainland Chinese, Hong Kong Chinese, East Asian Canadians, and European Canadians. The measurement model for the two social axioms across the four cultural groups showed adequate model fit:  $\chi^2(32, N = 566) = 40.79, p > .05$ , CFI = .98, NNFI = .97, and RMSEA = .04, indicating configural equivalence. After constraining the factor loadings to be equal across groups, the model still fit the data well:  $\chi^2(44, N = 566) = 44.28, p > .05$ , CFI = 1.00, NNFI = 1.00, and RMSEA = .01. More importantly, the chi-square difference test comparing the constrained and unconstrained models was not significant,  $\Delta\chi^2(12, N = 566) = 3.49, p > .05$ , suggesting metric equivalence. Scalar equivalence was tested because we would examine cultural differences in the means of

the two social axioms. After constraining intercepts of four parcels across the four groups, we obtained partial scalar equivalence as indicated by a non-significant chi-square difference test comparing the constrained and unconstrained models,  $\Delta\chi^2(6, N = 566) = 12.57, p > .05$ . In addition, the model fit the data adequately:  $\chi^2(50, N = 566) = 56.85, p > .05$ , CFI = .99, NNFI = .99, and RMSEA = .03. These results revealed that we could compare the means and associations of social axioms across the four cultural groups in a meaningful way.

### **Cross-Cultural Differences in the Measures**

Then, we examined cross-cultural differences of the target variables by conducting Analysis of Variance (ANOVA) and controlling for age and gender. Significant cultural effects were followed by pairwise comparisons with Fisher's Least Significant Difference (LSD) correction. Cultural differences were observed in all four variables (see Table 4 for means and standard deviations). For social cynicism,  $F(3, 557) = 48.12, p < .001$ , all four groups significantly differed from each other (all  $ps < .01$ ). Hong Kong Chinese reported the highest level of social cynicism, followed by Mainland Chinese and Asian Canadians, while European Canadians showed the lowest level. Level of reward for application also differed across cultures,  $F(3, 557) = 5.00, p < .01$ , with Hong Kong Chinese reporting a stronger belief in reward for application than the other three groups (all  $ps < .05$ ).

The four groups differed in independent self-construal,  $F(3, 555) = 11.22, p < .001$ . Hong Kong Chinese and Mainland Chinese reported lower levels of independent self-construal (with no significant differences between them) than East Asian Canadians, who were in turn lower than their European descent counterparts (all  $ps < .01$ ). The four groups also significantly differed in self-efficacy. Hong Kong Chinese rated themselves the lowest, followed by Mainland Chinese and East Asian Canadians,

while European Canadians reported the highest level (all  $ps < .05$ ).

### **Unpacking Cross-Cultural Differences in Self-Efficacy**

Mediation analysis was conducted using Mplus (Muthén & Muthén, 2007) with 1,000 bootstrap sampling. We tested whether social axioms could unpack the effect of culture on self-efficacy in addition to independent self-construal. We first dummy-coded the four cultural groups (with European Canadians being coded as 0). In the model, social cynicism and independent self-construal were modeled as mediators of the effect of the dummy coded culture variables on self-efficacy<sup>1</sup>, with age and gender included as covariates to control the possible effects of demographic variables. Bivariate correlations among the variables are presented in Table 5.

The indirect effect of independent self-construal as a mediator of cultural differences was significant among Mainland Chinese and European Canadians,  $\beta = -0.10, p < .001$ , and among Hong Kong Chinese and European Canadians,  $\beta = -0.10, p < .001$ <sup>2</sup>. In addition to independent self-construal, social cynicism explained cross-cultural differences in self-efficacy between Mainland Chinese and European Canadians,  $\beta = -0.06, p < .05$ , and between Hong Kong Chinese and European Canadians,  $\beta = -0.06, p < .05$ . More importantly, social cynicism mediated the differences in self-efficacy between East Asian Canadians and European Canadians,  $\beta = -0.14, p = .05$ , while independent self-construal did not,  $p = .21$ . Given the significant direct effects of culture on self-efficacy (all  $ps < .01$ ), partial mediation was observed.

These results show that independent self-construal accounted for Eastern vs. Western differences in self-perceived competence, but not the differences between East

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<sup>1</sup>Because reward for application was positively correlated with self-efficacy and Hong Kong Chinese reported the highest level of reward for application and lowest level of self-efficacy among the four cultural groups, reward for application could not mediate the cultural effects.

<sup>2</sup>Since the criterion is self-efficacy in this study, independent self-construal is conceptually a more relevant mediator than interdependent self-construal. Nevertheless, we tested the effect of interdependence but found its mediating effects were not significant,  $ps > .05$ .

Asian Canadians and European Canadians. Social cynicism, however, explained both Eastern vs. Western differences and differences between East Asian and European Canadians in self-efficacy in addition to the mediating effect of independent self-construal. Put together, Studies 1-2 show that world views explain individual differences in self-views over and above personality traits and explain cultural differences over and above self-construals.

### Study 3

The first two studies have demonstrated the functions of world views. Next, we attempted to identify the antecedents of world views by examining parental and peer influences on one's world views in Eastern and Western cultures. Specifically, we collected measures on social cynicism and reward for application from participants, their parents and close friends in Hong Kong, Mainland China, and Canada. We anticipated that the world views of parents and close friends are equally important to participants' world views in the three cultural groups.

### Method

#### Participants and Procedure

We recruited 110 Hong Kong Chinese participants from a university in Hong Kong (79 females,  $M_{age} = 20.23$ ,  $SD = 1.70$ ), 107 Mainland Chinese from a university in Beijing, China (77 females,  $M_{age} = 21.96$ ,  $SD = 2.70$ ), and 40 Canadians from a university in Vancouver, Canada (29 females,  $M_{age} = 21.23$ ,  $SD = 3.64$ ). For each student, one of their parents (Hong Kong: 94 females,  $M_{age} = 49.20$ ,  $SD = 5.12$ ; Mainland China: 65 females,  $M_{age} = 48.85$ ,  $SD = 4.26$ ; Canada: 32 females,  $M_{age} = 52.55$ ,  $SD = 5.90$ ) and one of their close friends (Hong Kong: 70 females,  $M_{age} = 20.35$ ,  $SD = 1.82$ ; Mainland China: 68 females,  $M_{age} = 22.20$ ,  $SD = 2.82$ ; Canada: 23 females,  $M_{age} = 21.40$ ,  $SD = 5.10$ ) were invited to fill out a questionnaire.

The questionnaire sets were administered separately to the participants and their

close friends, and the parent reports were collected by mail. Participants were instructed to complete the measures on their world views, while their parents and close friends reported their own world views.

### Measures

**Social cynicism and reward for application.** Similar to Study 1, the subscales of social cynicism and reward for application from the Social Axioms Survey (Leung et al., 2002) were used in this study. The reliabilities for the two social axioms were acceptable: social cynicism (Hong Kong:  $\alpha = .80, .82$ , and  $.79$  for students, parents, and friends, respectively; Mainland China:  $\alpha = .77, .78$ , and  $.77$  for students, parents, and friends, respectively; Canada:  $\alpha = .76, .86$ , and  $.76$  for students, parents, and friends, respectively), and reward for application (Hong Kong:  $\alpha = .68, .82$ , and  $.73$  for students, parents, and friends, respectively; Mainland China:  $\alpha = .72, .81$ , and  $.70$  for students, parents, and friends, respectively; Canada:  $\alpha = .58, .64$ , and  $.61$  for students, parents, and friends, respectively).<sup>3</sup>

### Results

Before examining cultural differences in parental and peer influences on one's endorsement of world views, we tested the measurement equivalence of social cynicism and reward for application across the Hong Kong, Mainland China and Canada samples. Two issues are noteworthy in the configural model. First, we examined the ratings of participants, their parent, and their friend in the same model, but separately for social cynicism and reward for application. Second, in each culture, the factor loadings of participants', their parent's, and their friend's world views were constrained to be equal, since the items were expected to deliver the same meanings across the three sets of respondents.

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<sup>3</sup>As the reliability coefficients of reward for application for Western samples were less than satisfactory in Studies 1-3, the results need to be interpreted with caution.

Similar to the procedure used in Studies 1 and 2, the hypothesized model was set as a baseline model, with the paths connecting the factors constrained to be equal across cultural groups to examine metric equivalence. The model with added constraints was then compared with the unconstrained, baseline model using the chi-square difference test. If there was no significant chi-square difference between the two models, we could conclude that the groups were equivalent even though equality constraints had been added. The groups would not be regarded as equivalent if the constrained model was significantly different from the unconstrained model.

The configural models fit the data well for both social cynicism,  $\chi^2(84, N = 257) = 93.02, p = .23, CFI = .99, NNFI = .98, \text{ and } RMSEA = .04$ , and reward for application,  $\chi^2(84, N = 257) = 95.31, p = .19, CFI = .98, NNFI = .97, \text{ and } RMSEA = .04$ , indicating that the two social axioms had equivalent factor structures across the three cultural groups. Then, to test for metric equivalence, factor loadings were constrained to be equal across the three cultures. The restricted models resulted in satisfactory goodness of fit statistics for both social cynicism,  $\chi^2(88, N = 257) = 96.08, p = .26, CFI = .99, NNFI = .99, \text{ and } RMSEA = .03$ , and reward for application,  $\chi^2(88, N = 257) = 95.69, p = .27, CFI = .99, NNFI = .98, \text{ and } RMSEA = .03$ . Furthermore, the model fit did not drop significantly in the restricted models for either social cynicism,  $\Delta\chi^2(4, N = 257) = 3.06, p = .55$ , or reward for application,  $\Delta\chi^2(4, N = 257) = .38, p = .98$ , showing that both social axioms had equivalent factor loadings across the three cultures. Thus, relations among the participants', their parent's and friend's levels of social cynicism and reward for application can be compared across the three cultures meaningfully.

To examine cultural differences in parental and peer influences on one's world views, we regressed participants' world views on their parent's and friend's world views (see Table 6 for means and standard deviations), and then constrained these

regression coefficients to be identical across the three cultures. Results indicated that the constrained models fit the data well for both social cynicism,  $\chi^2(92, N = 257) = 98.72, p = .29, CFI = .99, NNFI = .99$ , and RMSEA = .03, and reward for application,  $\chi^2(92, N = 257) = 103.44, p = .20, CFI = .98, NNFI = .97$ , and RMSEA = .04. Chi-square difference tests showed that the constrained and unconstrained models did not differ for either social cynicism,  $\Delta\chi^2(4, N = 257) = 2.64, p = .62$ , or reward for application,  $\Delta\chi^2(4, N = 257) = 7.75, p = .10$ , indicating that both parental and peer influences were equally important in affecting one's endorsement of social axioms across the three cultures.

Parents' social cynicism ( $\beta_{HK} = .37, p < .001; \beta_{ML} = .36, p < .001; \beta_{CA} = .45, p < .001$ ) and friends' social cynicism ( $\beta_{HK} = .20, p < .05; \beta_{ML} = .19, p < .05; \beta_{CA} = .18, p < .05$ ) significantly and positively predicted participants' social cynicism in all three cultures. It is worth noting that parental influence seemed to be a stronger predictor of participants' social cynicism than peer influence consistently in all three cultures, albeit statistically non-significant. On the other hand, parents' ( $\beta_{HK} = .35, p < .001; \beta_{ML} = .30, p < .001; \beta_{CA} = .39, p < .01$ ) and peers' reward for application ( $\beta_{HK} = .22, p < .05; \beta_{ML} = .16, p < .05; \beta_{CA} = .23, p = .06$ ) significantly and positively predicted participants' reward for application in all three cultures, though peer influence in Canada was only marginally significant ( $p = .06$ ). Again, parental influence was observed to be a stronger predictor of one's level of reward for application than peer influence in the three cultures, although it did not reach significance.

These results extend research on the development of world views from family, especially parental influence (e.g., Boehnke, 2009; Wong et al., 2011) to peer influence, which is also important while one forms beliefs about how the world functions. It is notable that our statistically rigorous comparisons across the three groups reveal that

both parental and peer influences on one's world views are significant across both Eastern and Western cultures. Thus, world views are derived from not only one's immediate social environment, but also one's extended interpersonal network outside the family. The formation process of world views is not limited to parental socialization.

#### **Study 4**

Having examined the antecedents of world views, we turn to their consequences. Studies 4-6 tested a mediation model with world views predicting psychological well-being through self-views. In this study, we aimed to examine the generalizability of the hypothesized model across developmental stages and thus recruited different age groups, including children, adolescents, and young adults. Specifically, we hypothesized that social cynicism would predict self-esteem and life satisfaction negatively and reward for application would predict self-esteem and life satisfaction positively, and in turn self-esteem would predict life satisfaction positively. This mediation model was hypothesized to hold across the three age groups, meaning that this cognitive process is consistent across development stages.

#### **Method**

##### **Participants and Procedure**

Data were collected from a total of 542 participants in Hong Kong. Among them, 119 children (48 females) were recruited from an elementary school, aged from 10 to 12 years old ( $M_{age} = 11.37$ ,  $SD = 0.77$ ); 203 adolescents (107 females) were recruited from two secondary schools, aged from 12 to 18 ( $M_{age} = 14.70$ ,  $SD = 1.84$ ); 220 undergraduate students were recruited from a university (121 females), aged from 17 to 25 ( $M_{age} = 19.67$ ,  $SD = 1.75$ ). All participants were native Hong Kong Chinese. They completed the following measures in quiet classrooms. They were also asked to report



demographic information, such as age and gender. A class teacher and an undergraduate major in psychology monitored the assessment sessions of the elementary school students. They were available to answer questions and clarify the meanings of uncertain words in the questionnaire when needed.

### Measures

**Social cynicism and reward for application.** As in Study 1 (social cynicism:  $\alpha = .79, .78$ , and  $.77$  for children, adolescents, and young adults, respectively; reward for application:  $\alpha = .81, .80$ , and  $.76$  for children, adolescents, and young adults, respectively).

**Self-esteem.** As in Study 1 ( $\alpha = .75, .89$ , and  $.89$  for children, adolescents, and young adults, respectively).

**Life satisfaction.** The five-item *Satisfaction with Life Scale* (SWLS; Diener, Emmons, Larsen, & Griffin, 1985) and an additional item from the Delighted-Terrible Scale (D-T Scale; Andrews & Withey, 1976) were used to measure an overall evaluation of one's life. Both were anchored on 7-point scales with the SWLS ranging from 1 (*strongly disagree*) to 7 (*strongly agree*) and the D-T Scale ranging from 1 (*terrible*) to 7 (*delighted*). A sample item is "In most ways my life is close to my ideal" ( $\alpha = .87, .88$ , and  $.91$  for children, adolescents, and young adults, respectively).

### Results

Descriptive statistics including means and standard deviations of all the measures are summarized in Table 7.

### Correlations among the Measures

Before testing the mediation model, we conducted correlational analysis to examine the relationships among the two social axioms, self-esteem, and life satisfaction (see Table 8).

For the children, life satisfaction was positively correlated with reward for application and self-esteem, with  $r = .36$  and  $.37$ , respectively,  $ps < .001$ . Self-esteem was negatively correlated with social cynicism,  $r = -.29$ ,  $p < .01$ .

For the adolescents, life satisfaction was significantly correlated with social cynicism, reward for application, and self-esteem, with  $r = -.29$ ,  $.25$ , and  $.53$ , respectively,  $ps < .001$ . Self-esteem was also correlated with both social cynicism and reward for application,  $r = -.40$  and  $.34$ , respectively,  $ps < .001$ .

For the young adults, life satisfaction was significantly correlated with social cynicism, reward for application, and self-esteem, with  $r = -.24$ ,  $.27$ , and  $.68$ , respectively,  $ps < .001$ . Self-esteem was also correlated with both social cynicism and reward for application,  $r = -.29$  and  $.30$ , respectively,  $ps < .001$ .

### Testing Mediating Effects

Path analysis was conducted to test our hypothesized mediation model based on analysis of covariance structures. We tested whether the hypothesized model fit the three age groups with multi-group analysis (see Figure 1). The goodness-of-fit of the hypothesized model was satisfactory, with  $\chi^2(3, N = 542) = 9.96$ , CFI = .98, NNFI = .87, and RMSEA = .07.

For the children, social cynicism significantly predicted self-esteem, and self-esteem significantly predicted life satisfaction,  $\beta = -.31$  and  $.23$ , respectively,  $ps < .05$ . The standardized path coefficient between reward for application and self-esteem was  $.17$ ,  $p = .06$ . In addition, the direct effect from social cynicism to life satisfaction was not significant,  $\beta = -.06$ ,  $p = .09$ , while the direct effect from reward for application to life satisfaction was significant,  $\beta = .36$ ,  $p < .05$ . The indirect effects of social cynicism and reward for application were  $-1.74$  ( $p < .05$ ) and  $1.27$  ( $p = .10$ ), respectively. The results suggested that self-esteem fully mediated the effect of social

cynicism on life satisfaction but marginally mediated the effect of reward for application on life satisfaction among children<sup>4</sup>.

For the adolescents, both social cynicism and reward for application significantly predicted self-esteem,  $\beta = -.34$  and  $.28$ , respectively,  $ps < .05$ . Self-esteem also significantly predicted life satisfaction,  $\beta = .47$ ,  $p < .05$ . The direct effects from both social cynicism and reward for application to life satisfaction were not significant,  $\beta = -.09$  ( $p = .09$ ) and  $.07$  ( $p = .14$ ). The indirect effects of social cynicism and reward for application were  $-7.00$  ( $p < .001$ ) and  $5.22$  ( $p < .001$ ), respectively. The results suggested that self-esteem fully mediated the effects of both social cynicism and reward for application on life satisfaction among adolescents.

Similar patterns were found with the young adults. Both social cynicism and reward for application significantly predicted self-esteem, and self-esteem significantly predicted life satisfaction,  $\beta = -.30$ ,  $.30$  and  $.64$ , respectively,  $ps < .05$ . The direct effects of social cynicism and reward for application were not significant,  $\beta = -.06$  ( $p = .15$ ) and  $.08$  ( $p = .06$ ), respectively, while the indirect effects were  $-4.43$  ( $p < .001$ ) and  $4.47$  ( $p < .001$ ), respectively. Hence, self-esteem fully mediated the effects of both axiom dimensions on life satisfaction among young adults.

### **Age Differences in the Mediation Model**

Then, we tested for invariance of the mediation model across the three age groups. First, when the path between social cynicism and self-esteem was constrained across the three groups, the chi-square difference test showed that the constrained and baseline models did not differ significantly,  $\Delta\chi^2(2, N = 542) = 1.20$ ,  $p = .55$ . Thus, all three groups were equivalent in the path between social cynicism and self-esteem.

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<sup>4</sup>To be consistent with other analyses in this paper, we used a two-tailed test in all of the studies, but actually our mediation model has directional predictions; if a one-tailed test had been used, self-esteem would have been considered a significant mediator of the relationship between reward for application and life satisfaction.

Second, for the path between reward for application and self-esteem, we compared the constrained and baseline models pairwise for the three groups. The Chi-square difference between the baseline and the model constraining children-adolescents, adolescents-young adults, and children-young adults was  $\Delta\chi^2(1, N = 542) = 1.92$  ( $p = .17$ ),  $.75$  ( $p = .39$ ),  $4.32$  ( $p < .05$ ), respectively. This indicated that the path between reward for application and self-esteem was different between young adults and children. As mentioned in the previous section, reward for application marginally predicted self-esteem for the children.

Finally, the path between self-esteem and life satisfaction was examined. The Chi-square difference between the baseline and the model constraining children-adolescents, adolescents-young adults and children-young adults was  $\chi^2(1, N = 542) = 0.53$  ( $p = .47$ ),  $9.54$  ( $p < .05$ ) and  $5.40$  ( $p < .05$ ), respectively. The relation between self-esteem and life satisfaction was stronger among young adults than for children and adolescents.

The current study found that the proposed mediation model is generally supported across the three age groups, viz., children, adolescents, and young adults, despite the association between self-esteem and reward for application being marginally significant in the children's sample and differing from the other two groups.

### Study 5

In the present study, we continued to examine the mediation model in which world views affect psychological well-being through the mediation of self-views, and adopted a prospective design to test the proposed model over four consecutive weeks, using both domain-general and domain-specific self-views and well-being indicators.

We hypothesized that domain general self-esteem would mediate the effect of social cynicism on life satisfaction and perceived stress. As aforementioned, a biased

view of human nature is negatively related to the positive self-image that contributes to well-being indicators, such as the well-established link between self-esteem and life satisfaction (e.g., Diener, 1984; Diener & Diener, 1995; Kwan et al., 1997). We also added perceived stress as another well-being indicator to assess one's responses to life's demands and hassles.

Previous research showed that the effects of social axioms on well-being can also be applied in specific areas, such as the academic domain. Using data from 40 cultural groups, Zhou, Leung, and Bond (2009) found that reward for application was positively correlated with student learning morale and student interest in and enjoyment of mathematics at the cultural level. In this study, we hypothesized that in the academic domain, self-perception of academic ability would mediate the relation between reward for application and academic satisfaction. Reward for application represents an optimistic view about utilizing individual abilities and resources for overcoming challenges and reaching goals. Individuals who believe in reward for application think that they can master academic skills and achieve satisfactory outcomes through continuous effort and hard work.

## **Method**

### **Participants and procedure**

The sample consisted of 173 Hong Kong university students (118 females,  $M_{age} = 19.63$ ,  $SD = 0.79$ ). Participants from a psychology course took part in the study on a voluntary basis. They were first invited to fill out a questionnaire measuring their world views and demographic information. Then they were instructed to complete online measures every week for four consecutive weeks. To reduce the attrition rate, we minimized the length of the weekly questionnaire by adopting single-item measures. Some items were selected because of their high factor loading on the measured

construct in other studies and best face validity, while other items were created for the purpose of this study. On average, participants completed the measures 2.81 times out of the maximum of 4 times.

### Measures

**Social cynicism and reward for application.** As in Study 1 ( $\alpha = .67$  and  $.74$  for social cynicism and reward for application, respectively, in this study)

**Self-perception of academic ability.** An item developed for this study, “Compared to the average student in this class, how would you rate your academic ability?”, was used to measure participants’ perception of their own academic ability on a 10-point Likert scale, ranging from 1 (*bottom 5% in the class*) to 10 (*top 5% in the class*).

**Academic satisfaction.** An item developed for this study, “Are you satisfied with your current academic progress or performance?”, was used to measure participants’ satisfaction with their academic performance on a 7-point scale, ranging from 1 (*I am very dissatisfied*) to 7 (*I am very satisfied*).

**Self-esteem.** We selected the item “At times I think I am not good at all” from the Rosenberg Self-Esteem Scale (Rosenberg, 1965) to measure self-esteem on a 7-point scale, ranging from 1 (*not very true to me*) to 7 (*very true to me*)<sup>5</sup>. After recoding, higher scores indicated higher self-esteem. For the purpose of the prospective design, participants were asked to rate the extent to which this item applied to them these days.

**Life satisfaction.** The single item *Delighted-Terrible Scale* (Andrews & Withey, 1976) was adapted to measure participants’ subjective evaluation of their life (i.e., “How do you feel about your life as a whole these days?”). They were asked to rate the

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<sup>5</sup>Previous research has reported the usefulness of using a single item to measure global self-esteem (Robin, Hendin, & Trzesniewski, 2001). However, due to the difficulty in translating the term *self-esteem* into Chinese, we selected an item from the Rosenberg Self-Esteem Scale rather than using this existing measure.

extent to which they agreed with the item on a 7-point scale, ranging from 1 (*terrible*) to 7 (*delighted*).

**Perceived stress.** The item “Do you feel stressed these days?” used in Chen, Benet-Martínez, Wu, Lam, and Bond (2013) measured participants’ subjective perception of the stress they had been under recently on a 7-point scale, ranging from 1 (*I do not feel stressed at all*) to 7 (*I feel extremely stressed*).

## Results

The present data have a multilevel structure with weekly measures (Level 1 within-person) nested within people (Level 2 between-person); therefore, we employed multilevel analysis with gender and age being controlled. Multilevel analysis was preferred, since more accurate parameter estimates were computed in nested data and missing data were handled. We followed the procedures outlined in Preacher, Zyphur, and Zhang (2010) to test for mediation effects using Mplus (Muthén & Muthén, 2007). While the within-person variables of academic ability and academic satisfaction were modeled at both level 1 and level 2, the between-person variable of reward for application was at level 2.

The domain-specific model assessed the mediation effect of self-perceived academic ability on the relation between reward for application and academic satisfaction (see Figure 2). Reward for application significantly and positively predicted self-perceived academic ability,  $\beta = .30, p < .01$ . Self-perceived academic ability significantly and positively predicted academic satisfaction,  $\beta = .41, p < .001$ . On the other hand, the direct effect from reward for application to academic satisfaction was not significant,  $\beta = .06, p = .84$ . The indirect effect of reward for application was .18 ( $p < .01$ ). The results suggested that self-perception of academic ability fully mediated the effect of reward for application on academic satisfaction.

We also tested the domain-general model with multilevel mediation analysis (see Figure 3). This model assessed the mediation effect of self-esteem on the paths from social cynicism to life satisfaction and perceived stress with both age and gender being controlled. Social cynicism negatively predicted self-esteem,  $\beta = -.17, p = .09$ . Self-esteem predicted life satisfaction positively and perceived stress negatively,  $\beta = .45 (p < .001)$  and  $-.29 (p < .01)$ , respectively. On the other hand, the direct effects from social cynicism to life satisfaction and perceived stress were not significant,  $\beta = -.06 (p = .64)$  and  $-.01 (p = .93)$ , respectively. The indirect effects of social cynicism on life satisfaction and perceived stress were  $-0.11 (p = .09)$  and  $0.08 (p = .10)$ , respectively. The results suggested that self-esteem partially mediated the effects of social cynicism on life satisfaction and perceived stress.

The two models converge to show that world views affect psychological well-being through the mediation of self-views. These effects last over time and hold across general and specific domains.

### Study 6

The results of Studies 4-5 have supported our proposed mediation model across age groups and over time, but the measures of self-views in these studies focus on positive self-evaluation. Positive and negative self-views are not necessarily a bipolar assessment of the self, but may involve different mechanisms (e.g., Spencer-Rodgers, Peng, Wang, & Hou, 2004). While positive self-views, such as self-esteem and self-efficacy, have been shown to predict psychological health (e.g., Kwan et al., 1997), not all types of negative self-views exert similar impact. In this study, we examined how world views affect well-being through both forms of negative self-evaluation: comparative and internalized self-criticism. As aforementioned, we hypothesized that social cynicism and reward for application would predict life satisfaction through the



mediation of comparative self-criticism rather than internalized self-criticism.

## Method

### Participants and Procedure

One hundred and twenty-four college students (85 females;  $M_{age} = 20.46$ ,  $SD = 1.36$ ) were recruited from a university in Hong Kong through mass emailing.

Participants completed the questionnaire consisting of the following measures online, and also reported demographic information, such as age and gender.

### Measures

**Social cynicism and reward for application.** Social cynicism and reward for application were assessed using the newly revised, 40-item Social Axioms Survey II (Leung et al., 2012) with eight items assessing each axiom dimension. This short form has been validated in Hong Kong Chinese and American samples (see Leung et al., 2012, Study 2). A sample item for social cynicism is “Powerful people tend to exploit others” ( $\alpha = .76$ ), and a sample item for reward for application is “One will succeed if he/she really tries” ( $\alpha = .79$ ).

**Comparative and internalized self-criticism.** The two forms of self-criticism were measured by the Levels of Self-Criticism Scale (Thompson & Zuroff, 2004), containing the 12-item comparative self-criticism subscale (e.g., “I often worry that other people will find out what I’m really like and be upset with me”) and the 10-item internalized self-criticism subscale (e.g., “I feel like a failure when I don’t do as well as I would like”). Respondents rated each statement on a 7-point scale ranging from 1 (*very inaccurate*) to 7 (*very accurate*) ( $\alpha = .70$  and  $.88$  for comparative self-criticism and internalized self-criticism, respectively).

**Life satisfaction.** Similar to Study 4, the Satisfaction with Life Scale (Diener et al., 1985) was used as an indicator of psychological well-being ( $\alpha = .88$ ).

### Results

First, we examined the zero-order correlations among the measures (see Table 9). Social cynicism was positively correlated with comparative self-criticism,  $r = .51, p < .001$ , while reward for application was negatively correlated with comparative self-criticism,  $r = -.24, p < .01$ . Interestingly, social cynicism was also significantly associated with internalized self-criticism,  $r = .32, p < .001$ . In addition, life satisfaction was negatively correlated with both comparative self-criticism,  $r = -.45, p < .001$ , and internalized self-criticism,  $r = -.29, p < .01$ .

We conducted path analysis to examine the mediating role of comparative self-criticism that links social axioms and life satisfaction, controlling for the effects of age and gender. In the path model, social cynicism and reward for application predicted both comparative self-criticism and internalized self-criticism, and then the two forms of self-criticism together predicted life satisfaction. The residuals for the two self-criticism variables were allowed to be correlated given that they both measured the construct of self-criticism.

Results of the path analysis are depicted in Figure 4. Consistent with the correlation findings, social cynicism positively predicted comparative and internalized self-criticism,  $\beta = 0.52, p < .001$ , and  $\beta = 0.32, p < .001$ , respectively. In contrast, reward for application negatively predicted comparative self-criticism,  $\beta = -0.24, p < .01$ . Comparative self-criticism significantly predicted life satisfaction,  $\beta = -0.38, p < .01$ , while internalized self-criticism did not,  $\beta = -0.11, p = .24$ . As a result, comparative self-criticism mediated the effect of social cynicism on life satisfaction fully (the indirect effect =  $-0.22, p < .001$ ; the direct effect =  $0.03, p = .78$ ) and mediated the effect of reward for application on life satisfaction partially (the indirect effect =  $0.10, p < .01$ ; the direct effect =  $0.16, p < .05$ ). The model fit the data well:  $\chi^2$

(8,  $N = 124$ ) = 6.72,  $p > .05$ , CFI = 1.00, NNFI = 1.00, and RMSEA = .00.

Thus, our results suggest that social cynicism and reward for application influence psychological well-being through comparative self-criticism, but not internalized self-criticism. That is, people high in social cynicism and those low in reward for application tend to evaluate themselves unfavorably by perceiving high standards from others, and subsequently failing to meet these external standards undermines their satisfaction with life. Put together, Studies 4-6 show that world views affect psychological well-being through self-views, and this mediation model holds across age groups, over time, in different domains, and with various self-views.

### **Study 7**

In this study, we tested the boundary condition of the proposed mediation model. As aforementioned, we hypothesized that holistic thinking would moderate the effects of world views on self-views and psychological well-being, since a person who perceives the world as interrelated is more likely to link beliefs about the world to beliefs about the self, compared with those who perceive entities in the world as separate. In particular, social cynicism captures a negative view of human nature and is especially related to one's conception about the self as a human being, and thus may exert significant effects on self-esteem and well-being among people high in holistic thinking rather than those low in holistic thinking. Similarly, the effect of reward for application on well-being (mediated by self-esteem) should also be stronger among holistic thinkers.

### **Method**

#### **Participants and Procedure**

One hundred and nine college students (77 females;  $M_{age} = 20.80$ ,  $SD = 1.67$ ) from a university in Hong Kong were recruited through mass emailing, notice boards and leaflets. Participants completed the questionnaire online, and also reported

demographic information, such as age and gender.

### Measures

**Social cynicism and reward for application.** As in Study 6 ( $\alpha = .79$  and  $.63$  in this study).

**Self-esteem.** As in Study 1, we used the Rosenberg Self-Esteem Scale (Rosenberg, 1965) on a 5-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*) ( $\alpha = .88$ ).

**Psychological well-being.** Psychological well-being was assessed by two indicators, viz., *life satisfaction* (as in Study 4,  $\alpha = .88$  in this study) and *subjective happiness*. The 4-item *Subjective Happiness Scale* (Lyubomirsky & Lepper, 1999) was used to tap global evaluation of happiness and well-being (e.g., “Some people are generally very happy. They enjoy life regardless of what is going on, getting the most out of everything. To what extent does this characterization describe you?”). Responses were anchored on a 7-point scale ranging from 1 (*very inaccurate*) to 7 (*very accurate*) ( $\alpha = .83$ ). A composite of psychological well-being was computed by averaging the standardized scores of life satisfaction and subjective happiness.

**Holistic thinking.** The 24-item Analysis-Holism Scale (AHS; Choi, Koo & Choi, 2007) was used to measure holistic cognitive–perceptual style (e.g., “Everything in the world is intertwined in a causal relationship”). Responses were anchored on a 7-point Likert scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*) ( $\alpha = .74$ ).

### Results

Descriptive statistics and bivariate correlations of the measures are summarized in Table 10. Social cynicism was negatively correlated with both self-esteem,  $r = -.33$ ,  $p < .001$ , and psychological well-being,  $r = -.28$ ,  $p < .01$ . Self-esteem was positively correlated with psychological well-being,  $r = .70$ ,  $p < .001$ .

To investigate the mediating effect of self-esteem on the relation between cynical world view and psychological well-being, as well as the moderating effect of holistic thinking on this linkage, a moderated mediation model was tested using the method outlined by Preacher, Rucker, and Hayes (2007). Results indicated that, controlling for age and gender, social cynicism negatively predicted self-esteem,  $\beta = -.36$ ,  $t(103) = -4.02$ ,  $p < .001$ , while self-esteem in turn positively predicted psychological well-being,  $\beta = .70$ ,  $t(102) = 11.48$ ,  $p < .001$ . As indicated by the significant indirect effect (indirect effect =  $-.25$ ,  $p < .001$ ), and the non-significant path from social cynicism to psychological well-being, self-esteem fully mediated the relation between social cynicism and psychological well-being.

More importantly, a significant interaction effect of holistic thinking with social cynicism on self-esteem was observed,  $\beta = -.17$ ,  $t(103) = -1.98$ ,  $p < .05$ . To interpret the interaction effect, the simple slope analysis was performed following the procedures suggested by Aiken and West (1991). The effects of social cynicism on self-esteem were examined at three values of holistic thinking (1 *SD* above mean value, mean value, and 1 *SD* below mean value). For those who were high in holistic thinking (1 *SD* above mean value), social cynicism significantly and negatively predicted self-esteem,  $\beta = -.53$ ,  $t(102) = -4.34$ ,  $p < .001$ . Similarly, for those who were moderate in holistic thinking (mean value), social cynicism still significantly and negatively predicted self-esteem,  $\beta = -.36$ ,  $t(102) = -3.83$ ,  $p < .001$ . Among those with low holistic thinking, social cynicism negatively predicted self-esteem, though it did not reach significance level,  $\beta = -.19$ ,  $t(102) = -1.34$ ,  $p = .18$ .

To further ascertain the moderating role of holistic thinking on the mediating effect of self-esteem on social cynicism and psychological well-being, indirect effects were calculated at different values of holistic thinking (1 *SD* above mean value, mean

value, and 1 *SD* below mean value). Overall, self-esteem mediated the effects of social cynicism on psychological well-being among those with high and moderate levels of holistic thinking, indirect effects =  $-.37/-.25$ ,  $ps < .001$ , but not among those with a low level of holistic thinking, indicating that holistic thinking exacerbated the effect of social cynicism on self-esteem, which in turn affected psychological well-being.

The mediation model with reward for application as a predictor was significant (indirect effect =  $0.15$ ,  $p < .05$ ), but the moderating effect of holistic thinking on the relation between reward for application and self-esteem did not reach significance,  $p > .05$ . Plausibly, this may be because reward for application is less strongly related to self-esteem than social cynicism. Holistic thinking may only moderate effects of reward for application on self-views that are especially relevant to this world view, such as perceptions of academic ability, but this was not tested here.

The moderation of holistic thinking on the effect of social cynicism shows that people who tend to perceive objects and events as interrelated are more likely to connect their cynical world view with their self-concept, and this negative impact on their self-view influences their life satisfaction and subjective happiness. For those who are less likely to perceive the world as interrelated, their cynical world view may not be linked to their self-view and well-being.

### **General Discussion**

The present research investigated the functions, antecedents, and consequences of general world views, operationalized as social axioms. We suggest that world views could explain individual differences in self-views over and above personality traits and explain cultural differences in self-views over and above self-construals. Specifically, the axiom factors of social cynicism and reward for application were found to predict both personal self-esteem and collective self-esteem among Hong Kong Chinese and

Americans (Study 1). While independent self-construal unpacked cultural differences in self-efficacy between geographically distant East-West groups, social cynicism further explained the differences in self-efficacy between East Asian and European Canadians (Study 2). To shed light on the formation of world views, we compared participant's social cynicism and reward for application to that of a parent and friend, and found equivalent correlations across Mainland China, Hong Kong, and Canada, such that both friend and family views were positively related to participant's world views, and self-parent correlations were only slightly stronger than self-friend correlations at the trend level (Study 3).

More importantly, we found support for a mediation model that delineates how world views affect outcome variables; i.e., that the effects of social axioms on psychological well-being are mediated by self-views. Using a cross-sectional design, the mediation model was generally supported across three age groups, including children, adolescents, and young adults (Study 4). We also tested and confirmed both domain-general and domain-specific models with a prospective design over four consecutive weeks, showing that both general and academic-specific self-views mediated the effects of social axioms on well-being (Study 5). We further differentiated between two pathways of the negative self-evaluation process, showing that comparative self-criticism, not internalized self-criticism, played a significant mediating role (Study 6). Finally, to identify boundary conditions on the mediation model, we demonstrated the significant moderation effects of holistic thinking on the connection between world views and self-views, such that only among individuals with high and moderate levels of holistic thinking were world views (social cynicism) and self-views (self-esteem) interrelated (Study 7).

The present research encompassed different world views (social cynicism and

reward for application), various self-views (personal self-esteem, collective self-esteem, self-efficacy, self-perception of academic ability, and comparative and internalized self-criticism), and multiple well-being indicators (life satisfaction, perceived stress, subjective happiness). It employed diverse sampling (Mainland Chinese, Hong Kong Chinese, East Asian Canadians, European Canadians, and Americans), different age groups (children, adolescents, and young adults), multiple sources (self, parents, and friends), and various methods (prospective and cross-sectional). Overall, the results are consistent across studies, converging to show the relations among world views, self-views, and psychological well-being, and confirm the utility, predictive validity, and pathways of social axioms.

### **World Views in Relation to Self-Views**

In personality and social psychological research, self-views, such as self-esteem and self-efficacy, have been studied extensively (e.g., Swann et al., 2007), but world views received much less attention until Leung and colleagues (2002) proposed the construct of social axioms and developed a measure to operationalize it. Early work on social axioms has been relatively inductive and exploratory in nature (Leung et al., 2012), with researchers around the world validating the factor structure, establishing the construct validity, and examining the predictive power of social axioms (e.g., Leung & Bond, 2009). With a well-validated factor structure and cumulative evidence about the main effects of social axioms, a deductive approach is needed to theorize about the cognitive processes underlying how social axioms work.

The present research conceptualizes world views as a distal force and self-views as a proximal force which exert influence on important individual-level outcomes. A major determinant of self-views is personality traits (e.g., Robins et al., 2001). As reiterated in the above results, dispositional and enduring characteristics do explain



individual differences in self-views. It is not surprising to find that self-esteem was positively predicted by extraversion, intellect, and conscientiousness but negatively predicted by neuroticism in Study 1. But after controlling for the five personality factors, social cynicism and reward for application were still significant predictors of self-esteem, indicating that inherent in self-views are not only schematic representations of internal attributes but also mental convictions about external contexts. This is evident in both Eastern and Western cultures.

Social cynicism and reward for application also predicted global, personal self-esteem, which stems from personal aspects of one's identity, such as values, ideas, goals, and emotion, as well as collective self-esteem (Luhtanen & Crocker, 1992), which derives from one's collective identity, based on group memberships, such as gender, race, religion, ethnicity, and socioeconomic class. As world views constitute beliefs about other people, social institutions, and the spiritual world, they shape individuals' judgments of how good or worthy they are as members of their social group and how other people evaluate their social group. Personal and collective identities are two distinct aspects of the self-concept (Taifei & Turner, 1979, 1986). World views explain both aspects significantly over and above personality traits in Eastern and Western cultures.

### **Unpacking Cultural Differences in Self-Views**

Social axioms have emerged as a meaningful additional framework to capture cultural variations (Leung et al., 2002; Leung & Bond, 2004). As in many multicultural studies, major cultural dimensions have been generated to map the positioning of multiple cultural groups, adding to research such as Hofstede's (1980) work-related values, Schwartz's (1994) culture-level values, and those of Inglehart and Baker (2000). While many of these dimensions categorize cultures in terms of how psychologically

distant individuals feel from one another, individualism-collectivism is the most typical way of describing that. At the individual level, researchers have used its counterpart, independent vs. interdependent self-construals, to unpack cultural differences in psychological variables (e.g., Singelis, Bond, Sharkey, & Lai, 1999). Since self-construals are regarded as a cultural self-view, empirical research has rarely demonstrated other dimensions that can unpack cultural differences in self-views over and above self-construals.

The results in Study 2 indicate that people from a Western culture perceive themselves as higher in competence than do people with an Eastern heritage. These cross-cultural differences could be partly explained by Westerners' view of themselves as unique individuals, emphasizing the importance of their internal attributes, and hence they are more likely to believe in their capabilities and competence in achieving their goals than Easterners. Additionally, the greater prevalence of social cynicism among Easterners—believing that other people take advantage of them and that social institutions are not trustworthy—may have further dampened their confidence in their ability to attain desired outcomes, thus leading to lower self-efficacy as compared to their Western counterparts in the same society. It is important to note the finding that social cynicism explains the group differences between East Asian Canadians and European Canadians, but independent self-construal does not. Although both groups differed in independent self-construal and social cynicism, independent self-construal no longer serves as an explanation of self-efficacy differences in an independent Western cultural context, while social axioms demonstrate additional explanatory power in such cases. To our knowledge, this is the first time world views have been shown to explain cultural differences beyond self-construals.

### **Formation and Development of World Views**

Previous studies have shown similarity in social axioms between university students and their parents (Boehnke, 2009) and the impact of family functioning on children's social axioms (Wong et al., 2010), focusing on the pivotal role of family, especially parents, in shaping children's beliefs about the world. Study 3 extended the investigation to both Eastern and Western cultures, and found support for both parents and peers as important sources of influence on world views. Participants' ratings of social cynicism and reward for application are significantly predicted by not only their parents' but also their close friends' scores on these two axioms. The factor structure of the three sources (self, parent, and friend) is invariant across the three cultural groups, and the pathways from parents' and friends' world views to participants' own world views are also equivalent across cultures, indicating that the influence of close others on world views is a culture general process.

In addition to genetic heredity, parental influence on the formation of world views may be through socialization, in which parents transmit values, beliefs, and attitudes to their children through teaching, training, or modeling. The dissemination of beliefs about how the world operates may help children function properly in the outside world and maintains societal continuity. Peer influence on world views, however, may be more likely to be mutual. People can be active agents in exerting an impact on those around them, though they may also feel obliged to adopt others' attitudes, beliefs, and behaviors due to peer pressure. Participants may also choose friends who are similar to them in attitudes and values (e.g., Byrne, 1961), including world views.

Some researchers have argued that parental influence is less important than peer influence in Western culture; for instance, the importance of family decreases as American adolescents grow up, but their Japanese counterparts tend to value both family and peer groups (e.g., Rothbaum, Pott, Azuma, Miyake, & Weisz, 2000). While

the paths to the development of close relationships vary across cultures, cultural differences exist in the meaning and dynamics, as opposed to the importance and strength, of a relationship. The cross-sectional design of the present study does not allow us to make causal conclusions about the direction of influence. It is possible that how world views are construed and shared among people and close others may be pan-cultural, just as the process of socialization and social learning is general, but the content of what is inherited and acquired may vary. Future research should examine the processes underlying parental and peer influences on the development of world views. Other than the influences of family and friends, world views are also developed through interaction with the social and physical environment, and how to measure such non-interpersonal contingencies on the development of social axioms is another important question for future research.

### **Pathways of Social Cynicism**

Studies 4-7 converge to support our hypothesized model that world views affect psychological well-being through the mediation of self-views. Specifically, self-esteem significantly mediated the relation between social cynicism and life satisfaction across all three age groups in Study 4, and over time in Study 5. The negative effect of social cynicism on life satisfaction is consistent with results in previous studies (e.g. Chen et al., 2006; Lai et al., 2007). The negativity and mistrust of socially cynical individuals hinders their interactions with others and yet may act as a negative interpersonal influence, preventing individuals from creating or maintaining positive relationships with others. As shown by Darley and Fazio (1980), people who hold negative views of others decrease and avoid interactions with them. Thus, social cynics tend to have fewer associates and elicit less social support. Social disengagement then gives rise to lower self-worth and decreased self-esteem (Lai et al., 2007).

The association of social cynicism with negative self-views is also exhibited in psychological pain, perceived burdensomeness, thwarted belongingness, and suicidal ideation (Chen et al., 2009; Lam et al., 2010), directing individuals away from hope and goal attainment (Bernardo, 2013). Moreover, being high in cynical hostility is associated with higher stress, less social support, and more conflict in family, marital and work domains (Smith, Pope, Sanders, Allred, & Keeffe, 2004). Mitchelson and Burns (1998) also found that cynicism was positively correlated with negative forms of perfectionism, and in turn related to a decreased sense of overall satisfaction with life and satisfaction with self. Our criterion variables include both positive and negative mental health indicators (life satisfaction and perceived stress in Study 5), and attest to the generality of pathways for social cynicism in primary school, secondary school, and university samples (Study 4).

### **Pathways of Reward for Application**

Similar to social cynicism, the effects of reward for application on psychological well-being are also mediated by self-views. Previous studies found that reward for application was positively related to life satisfaction in university samples of Mainland Chinese (e.g. Chen et al., 2006) and Hong Kong Chinese (e.g. Lai et al., 2007), but did not reveal the underlying mechanisms. Again, the present research extended this effect to children and adolescents and further identified the mediating variables to explain the predictive framework. Reward for application acts as a positive mental resource to foster the perception of self-competence and help individuals cope with difficulties and failures. Those who are higher in reward for application develop higher self-esteem, conducive to higher satisfaction in life. As shown in Study 4, this mediation model is also applicable to domain-specific predictions. University students' belief in reward for application positively predicted their perception of academic ability, while confidence

in one's ability to complete academic tasks or achieve academic goals contributes to satisfaction in the academic domain.

The indirect effect of reward for application varies across different age groups. Self-esteem fully mediated the link between reward for application and life satisfaction among young adults and adolescents, but the mediation effect was only marginally significant among children. We speculate that this result highlights the importance of differentiating between world views and self-views. While reward for application captures whether an effort-success link is believed to exist in the world in general, self-esteem denotes how an individual feels about one's self-worth in particular. In this sense, reward for application can be regarded as an antecedent of developing a positive self-concept, as perceiving one's life situation as a rewarding environment promotes internal locus of control. Compared to children who have had fewer interactions with their social and physical environment, adolescents and young adults have accumulated more personal experiences that help them translate such generalized expectancies into self-efficacious beliefs. A social learning process is needed to establish associations between world views and self-views. Another possibility is that adolescents and young adults are more likely to see a tight link between effort and success, probably due to the relatively objective, academically competitive context in which they engage. They are more likely to define themselves using academic outcomes, a reflection of the interplay between reward for application and their academic experiences.

### **Negative Self-Evaluation Process**

In addition to positive self-views, the present research differentiated two types of negative self-views and thus uncovers the pathways from world views to psychological well-being through the negative self-evaluation process. The differentiation between comparative and internalized self-criticism represents two distinct driving forces:

communion, which concerns close relationships with others and a sense of belonging, vs. agency, which involves individuating oneself and achieving mastery and power (Bakan, 1966). When people engage in introjection, a process whereby they reproduce the attributes or behaviors of others within themselves, these two modalities of human existence drive individuals to focus on different aspects of experience (Blatt & Blass, 1992). Attending to externalized high standards, perceiving hostility from others, and feeling inferior to others characterize comparative self-criticism, whereas attending to internalized high standards, perceiving worthlessness in the self, and feeling unable to meet one's own ideals characterize internalized self-criticism (Thompson & Zuroff, 2004).

Interestingly, comparative self-criticism mediated the effects of social cynicism and reward for application on life satisfaction, but the mediating effect of internalized self-criticism did not reach significance in Study 6. A negative self-view derived from comparison with others (i.e., comparative self-criticism) describes a person who perceives others as demanding and hostile, which corresponds to the negative view of human nature denoted by social cynicism. Since believing that externalized standards are too high to reach is a result of comparative self-criticism, the belief in hard work leading to success (i.e., reward for application) would be negatively related to comparative self-criticism. A sense of inferiority and inability to meet challenges and overcome difficulties may thus lower one's satisfaction with life. In contrast, internalized self-criticism generates an unrealistic definition of success. These unreasonably high standards stem from the self rather than from the surrounding world, and hence do not channel the influence of world views onto the evaluation of life.

### **Moderating Effects of Holistic Thinking**

Though our hypothesized mediation model is supported across age groups and

over time, the moderating role of holistic thinking is noteworthy. Social cynicism significantly predicted self-esteem only among people with high rather than low levels of holistic thinking in Study 7. Holistic thinking is essentially an associative cognitive style that perceives the context as a whole and the world as interconnected (Nisbett, Peng, Choi, & Norenzayan 2001). The orientation to relations among entities and between entities and their surrounding context appears to also connect world views and self-views, such that global beliefs are extended to the self and then affect their psychological health. The cynical beliefs of people high on holistic thinking also shapes their self-esteem, whereas the self-worth of those low on holistic thinking is more agentic and not affected by their negative view of the world. Analytic thinkers tend to judge objects independently and separate the self from others, which may explain why they do not carry world views into the evaluation of themselves and their lives.

The present research focuses on social cynicism and reward for application as world views. Future studies may explore other factors of social axioms, viz., social complexity, fate control, and religiosity, and their effects on other aspects of self-views. For example, social complexity reflects the belief in multiple solutions to social problems and in different ways of achieving various outcomes (Leung et al., 2002). This world view may affect self-complexity, i.e. perceiving oneself as having distinct aspects in social roles, relationships, and activities, etc. (Linville, 1985). Though individual differences in self-complexity predict physical and mental health, both high- and low- self-complexity have benefits (e.g., Brown, 1998; Linville, 1987; McConnell, Strain, Brown, & Rydell, 2009); whether and how social complexity works through self-complexity to affect psychological well-being awaits future research.

The linkage between world views and self-views may also be moderated by other individual difference variables, such as need for cognition (Cacioppo & Petty, 1982)



and need for cognitive closure (Kruglanski & Webster, 1996; Webster & Kruglanski, 1994). People who prefer to engage in cognitive processing and enjoy cognitive endeavors may be more likely to internalize their world views and project them onto the self and well-being. Those who tend to desire a firm answer and quick information may also be more likely to seek parsimonious solutions and build linkage between world views and self-views to avoid ambiguity and uncertainty. Nevertheless, these moderating effects are speculative and need to be validated with further studies.

### **Concluding Remarks**

In the present research, we attempted to answer the questions of why world views matter and how they matter. People develop their world views throughout their lives. Research has documented that children, even as young as second grade, start to develop a sense of cynicism (Mills & Keil, 2005). Young children are cynical in thinking about how self-interest affects what people say and are less likely to believe statements that are consistent with self-interest. In addition, children intuitively explain incorrect statements consistent with self-interest in terms of lies, but explain incorrect statements against self-interest in terms of mistakes. However, the development of cynicism does not stop at this stage. Steinberg, Greenberger, Ruggiero, Garduque, and Vaux (1982) found that part-time employment experience led to the development of cynical attitudes toward work among high school students. Personal feelings and experiences of cynicism depict individual characteristics, which are distinct from social beliefs (Kurman, 2011), but as people grow through experience and interact with others, they form judgments about human nature and social institutions, developing social cynicism.

World views are also important to people's self-views and psychological well-being. World views and self-views are mutually dependent (Kurman, 2011). As

Anaïs Nin (1961) put it, “We don't see things as they are, we see them as we are.” If world views are conceptualized as perceptions of the general situation (Bond, 2013), while self-views are perceptions of the self, situation-as-perceived and the self-as-perceived may affect psychological and behavioral outcomes either separately, jointly, interactively, or sequentially. Their relative importance and underlying mechanisms depend on the type of world views and self-views in relation to criterion variables. In Kurman's (2011) studies, social axioms were more predictive of behaviors that were logically affected by how others are expected to behave, whereas personal characteristics were more predictive of self-directed behavior. In the present research, mediation effects of self-views are found to vary depending on the specific social axiom. Since self-esteem and comparative self-criticism are more related to social cynicism than reward for application, they show full mediation effects of social cynicism but partial mediation of reward for application in Studies 4, 5, and 6. Perceived academic ability is more relevant to reward for application, thus yielding a full mediation effect in Study 5.

If the self is conceived of as an entity in the world, world views and self views should be related, though world views are relatively general and self-views are specific. The relations between world views and self-views may thus be reciprocal, through both deductive reasoning from general to particular and inductive reasoning from particular to general. Our studies thus far demonstrate how world views influence psychological well-being through the mediation of self-views, but theoretically the evaluation of oneself can also be extended to the world around the self. To understand how humans interact with the world and vice versa, both self-views and world views matter.

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Table 1

*Descriptive Statistics and Bivariate Correlations among Measures for Hong Kong and U.S. Samples in Study 1*

		Hong Kong ( <i>n</i> = 155)								
	<i>Mean (SD)</i>	1	2	3	4	5	6	7	8	9
1. Social cynicism	3.10 (0.45)	-								
2. Reward for application	3.74 (0.38)	.01	-							
3. Neuroticism	3.28 (0.80)	.27**	-.12	-						
4. Extraversion	2.71 (0.72)	-.01	.17	-.14	-					
5. Intellect	3.27 (0.71)	-.07	-.09	.08	.19*	-				
6. Agreeableness	3.56 (0.55)	-.15	.22**	.05	.38***	.04	-			
7. Conscientiousness	3.50 (0.60)	-.13	.17*	-.27**	-.00	.04	.18*	-		
8. Self-esteem	2.83 (0.42)	-.28**	.26**	-.38***	.40***	.24**	.24**	.44***	-	
9. Collective self-esteem	4.80 (0.67)	-.27**	.25**	-.19*	.27**	-.05	.34***	.29***	.49***	-
		U.S. ( <i>n</i> = 216)								
	<i>Mean (SD)</i>	1	2	3	4	5	6	7	8	9
1. Social cynicism	2.76 (0.44)	-								
2. Reward for application	3.62 (0.38)	.11	-							
3. Neuroticism	2.79 (0.80)	.21**	-.13	-						
4. Extraversion	3.23 (0.95)	-.10	.03	-.20**	-					
5. Intellect	3.59 (0.73)	-.13	.01	-.28***	.18**	-				
6. Agreeableness	3.99 (0.62)	-.26***	.23**	-.12	.25***	.26***	-			
7. Conscientiousness	3.46 (0.79)	-.16*	.19**	-.12	.13	.03	.18**	-		
8. Self-esteem	3.09 (0.56)	-.35***	.16*	-.48***	.37***	.26***	.16*	.14*	-	
9. Collective self-esteem	5.24 (0.87)	-.42***	.32***	-.18**	.31**	.10	.40***	.22**	.39***	-

*Note.* \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ .



Table 2

*Results of Regression Analysis on Self-Esteem for Hong Kong and U.S. Samples in Study 1*

	Hong Kong ( <i>n</i> = 155)						U.S. ( <i>n</i> = 216)					
	Block 1		Block 2		Block 3		Block 1		Block 2		Block 3	
<b>DV: Self-Esteem</b>	<i>b</i>	$\beta$	<i>b</i>	$\beta$	<i>b</i>	$\beta$	<i>b</i>	$\beta$	<i>b</i>	$\beta$	<i>b</i>	$\beta$
Age	.05*	.02	.01	.02	.01	.04	.02	.11	.02	.09	.01	.07
Gender	-.02	-.03	-.03	-.04	-.03	-.04	.09	.07	.03	.02	.05	.05
Neuroticism			-.14***	-.27	-.11**	-.21			-.26***	-.38	-.22***	-.31
Extraversion			.17***	.20	.17***	.30			.17***	.28	.17***	.29
Intellect			.11**	.18	.11**	.18			.06	.08	.07	.09
Agreeableness			.05	.06	.00	.00			.03	.03	-.05	-.06
Conscientiousness			.24***	.34	.23***	.33			.03	.04	.00	.00
Social cynicism					-.14*	-.16					-.35***	-.27
Reward for application					.18*	.16					.21*	.14
Adjusted $R^2$	.02		.41		.44		.01		.31		.38	
$\Delta R^2$	.03		.41***		.04**		.02		.32***		.07***	

*Note.* \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ .

Table 3

*Results of Regression Analysis on Collective Self-Esteem for Hong Kong and U.S. Samples in Study 1*

	Hong Kong ( <i>n</i> = 155)						U.S. ( <i>n</i> = 216)					
	Block 1		Block 2		Block 3		Block 1		Block 2		Block 3	
<b>DV: Collective Self-Esteem</b>	<i>b</i>	$\beta$	<i>b</i>	$\beta$	<i>b</i>	$\beta$	<i>b</i>	$\beta$	<i>b</i>	$\beta$	<i>b</i>	$\beta$
Age	.10**	.24	.08*	.19	.08*	.18	.03	.09	.04	.11	.02	.07
Gender	-.13	-.10	-.12	-.09	-.11	-.08	-.24	-.13	-.11	-.06	-.09	-.05
Neuroticism			-.11	-.13	-.05	-.06			-.12	-.11	-.02	-.02
Extraversion			.14	.14	.15	.16			.19**	.21	.20***	.22
Intellect			-.11	-.11	-.11	-.12			-.07	-.06	-.05	-.05
Agreeableness			.29**	.24	.20*	.17			.46***	.33	.25**	.18
Conscientiousness			.22*	.19	.20*	.18			.12	.11	.04	.03
Social cynicism					-.30**	-.20					-.74***	-.38
Reward for application					.25	.14					.69***	.30
Adjusted $R^2$	.06		.22		.27		.01		.22		.38	
$\Delta R^2$	.07**		.19***		.05**		.02		.22***		.16***	

Note. \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ .

Table 4

*Means and Standard Deviations of Measures across Cultural Groups in Study 2*

	Mean ( <i>SD</i> )			
	Self-efficacy	Social cynicism	Reward for application	Independent self-construal
Mainland Chinese ( <i>n</i> = 199)	2.65 (0.45)	3.09 (0.50)	3.61 (0.52)	5.07 (0.64)
Hong Kong Chinese ( <i>n</i> = 206)	2.51 (0.49)	3.25 (0.44)	3.76 (0.43)	5.04 (0.56)
East Asian Canadian ( <i>n</i> = 78)	2.93 (0.41)	2.74 (0.45)	3.58 (0.47)	5.33 (0.59)
European Canadian ( <i>n</i> = 83)	3.11 (0.39)	2.55 (0.49)	3.56 (0.42)	5.41 (0.57)

Table 5

*Bivariate Correlations among Measures in Study 2*

	1	2	3	4	5	6
1. Self-efficacy	-					
2. Social cynicism	-.24***	-				
3. Reward for application	.16***	.07	-			
4. Independent self-construal	.44***	-.03	.17***	-		
5. Age	-.05	.01	-.02	-.08*	-	
6. Gender (1 = Male, 0 = Female)	-.06	-.11**	.04	-.19***	.03	-

*Note.* \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ .

Table 6

*Means and Standard Deviations of Participants', Parents' and Peers' World Views across Cultural Groups in Study 3*

	Mean ( <i>SD</i> )					
	Participants		Parents		Peers	
	Social cynicism	Reward for application	Social cynicism	Reward for application	Social cynicism	Reward for application
Hong Kong Chinese ( <i>n</i> = 110)	3.19 (0.45)	3.75 (0.34)	3.16 (0.45)	3.76 (0.39)	3.26 (0.44)	3.65 (0.39)
Mainland Chinese ( <i>n</i> = 107)	3.08 (0.43)	3.75 (0.41)	3.09 (0.41)	3.90 (0.41)	3.12 (0.40)	3.75 (0.35)
European Canadians ( <i>n</i> = 40)	2.77 (0.43)	3.63 (0.35)	2.51 (0.52)	3.59 (0.36)	2.84 (0.40)	3.68 (0.33)

Table 7

*Means and Standard Deviations of Measures across Age Groups in Study 4*

	Children ( <i>n</i> = 119)	Adolescents ( <i>n</i> = 203)	Young adults ( <i>n</i> = 220)
	<i>Mean (SD)</i>	<i>Mean (SD)</i>	<i>Mean (SD)</i>
Social cynicism	2.97 (0.62)	3.00 (0.45)	3.22 (0.43)
Reward for application	3.61 (0.71)	3.66 (0.48)	3.69 (0.40)
Self-esteem	2.61 (0.48)	2.88 (0.52)	2.87 (0.54)
Life satisfaction	4.73 (1.47)	4.52 (1.06)	4.30 (1.27)

Table 8

*Bivariate Correlations among Measures in Each Age Group in Study 4*

Children ( <i>n</i> = 119)				
	1	2	3	4
1. Social cynicism	-			
2. Reward for application	.89	-		
3. Self-esteem	-.29**	.09	-	
4. Life satisfaction	-.10	.36***	.37***	-
Adolescents ( <i>n</i> = 203)				
	1	2	3	4
1. Social cynicism	-			
2. Reward for application	-.21**	-		
3. Self-esteem	-.40***	.34***	-	
4. Life satisfaction	-.29***	.25***	.53***	-
Young adults ( <i>n</i> = 220)				
	1	2	3	4
1. Social cynicism	-			
2. Reward for application	.05	-		
3. Self-esteem	-.29***	.30***	-	
4. Life satisfaction	-.24***	.27***	.68***	-

*Note.* \* $p < .05$ , \*\* $p < .01$ , \*\*\*  $p < .001$

Table 9

*Descriptive Statistics and Bivariate Correlations among Measures in Study 6*

	<i>Mean (SD)</i>	1	2	3	4	5
1. Social cynicism	3.25 (0.50)	1				
2. Reward for application	3.77 (0.48)	.003	1			
3. Comparative self-criticism	4.05 (0.63)	.51***	-.24**	1		
4. Internalized self-criticism	4.76 (0.88)	.32***	.05	.53***	1	
5. Life satisfaction	4.29 (1.12)	-.20*	.25**	-.45***	-.29**	1

*Note.* \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ .



Table 10

*Descriptive Statistics and Bivariate Correlations among Measures in Study 7*

	<i>Mean</i>	<i>SD</i>	1	2	3	4
1. Social cynicism	3.06	.53	-			
2. Self-esteem	2.81	.40	-.33***	-		
3. Psychological well-being	4.57	.91	-.28**	.70***	-	
4. Holistic thinking	5.22	.43	-.01	-.04	-.07	-

*Note.* \* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

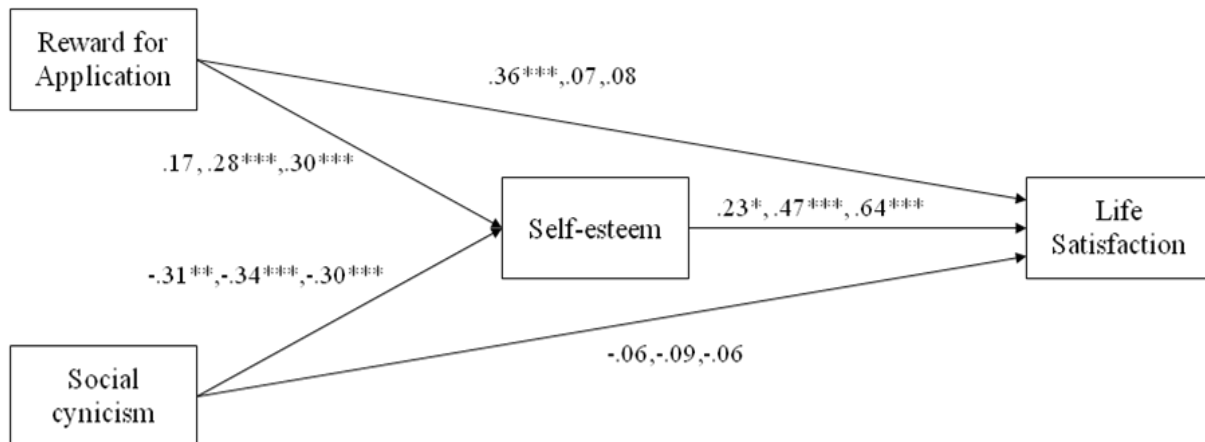


Figure 1. Multi-group model with standardized coefficients in Study 4

Note. Coefficients are presented in the order of children, adolescent and young adult samples.

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

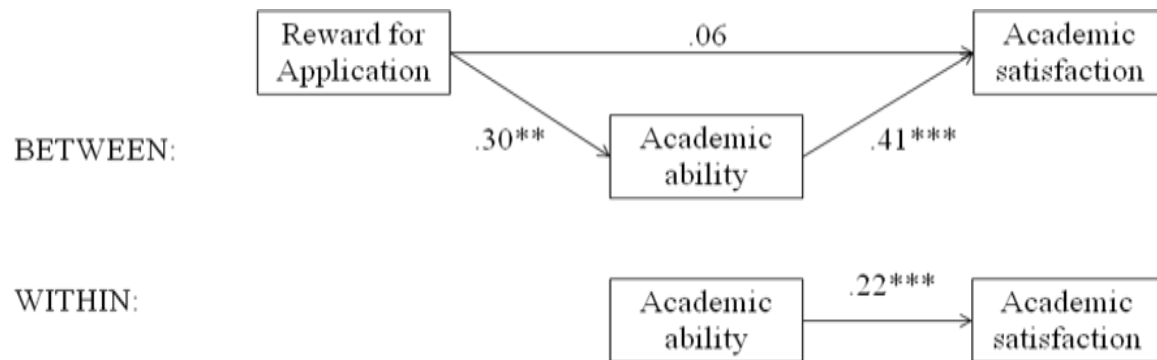


Figure 2. Domain-specific model in Study 5.

\*\* $p < .01$ . \*\*\* $p < .001$ .

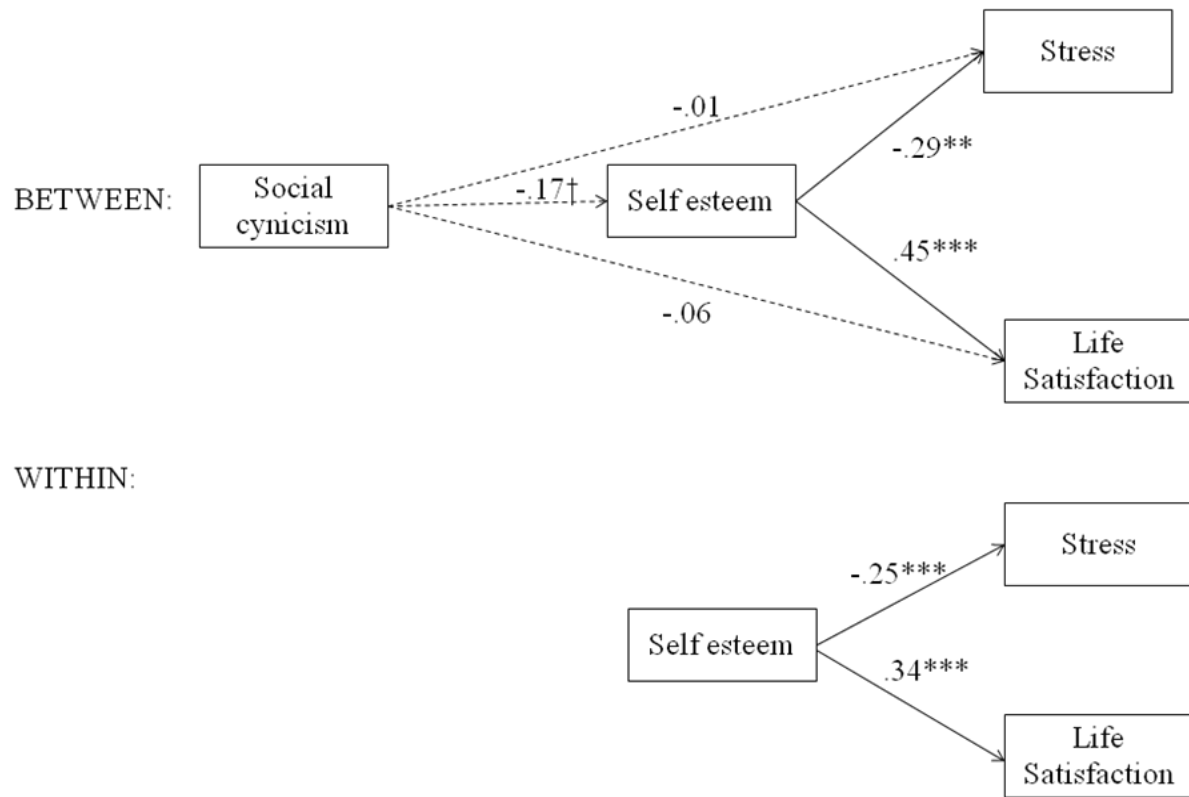


Figure 3. Domain-general model in Study 5.

† $p < .10$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

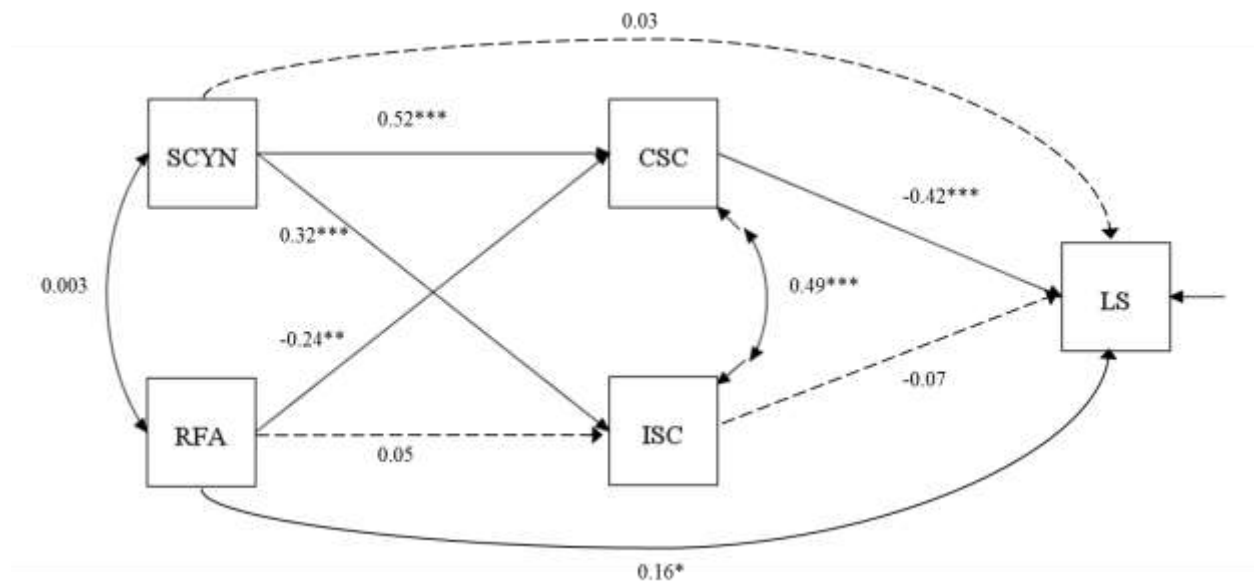


Figure 4. Summary of results for the path analysis in Study 6

*Note.* Standardized estimates are reported, with age and gender controlled for. Non-significant effects are shown in dotted lines. SCYN = Social cynicism, RFA = Reward for application, CSC = Comparative self-criticism, ISC = Internalized self-criticism, LS = Life satisfaction.

\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ .